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AEROSOL AGE

THE MAGAZINE OF PRESSURE PACKAGING

1/2

Chicago

CSMA — Chemical Specialties Mfrs. Association — Founded 1914

May 20-22

IN THIS ISSUE:

Trends in Insecticides

Methylene Chloride in Aerosols

Metering Valves

Labeling Suggestions

Pressure Packaging in Italy

Metal Containers for Aerosols

JUNE, 1956

How to save up to 6¢ per unit

on your AEROSOL PRODUCT

It doesn't take a very sharp pencil to figure the profit you are losing when you ship your aerosol product from an eastern or mid-western warehouse to the west coast. Depending on the method of shipment, it can easily add 2¢ to 6¢ per unit to the cost!

No longer is it necessary to sustain these losses. By taking advantage of G. Barr & Company's new Los Angeles aerosol filling plant, high transportation costs can be EXTRA PROFITS for you and your west coast customers need not wait days for merchandise to arrive from the east . . . it can be made in the same market as it is sold.

With three complete, strategically located plants available—New York, Chicago, Los Angeles—arranging your custom aerosol production can be simplicity itself. Only one management to deal with, yet all three plants operating in accordance with the same high standards to exactly meet your specifications.

Whether your aerosol product is packaged in metal or glass, in thousands or millions of units . . . whether you have a product now on the market, or in the experimental or idea stage, you cannot afford to overlook the production and product development facilities G. Barr & Company provides.

We will be pleased to present exact figures.

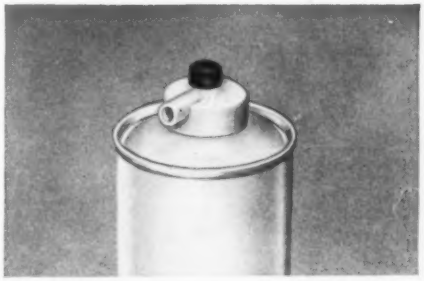
WRITE, WIRE OR PHONE:

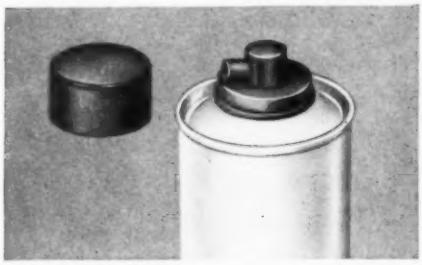
G. BARR & COMPANY

3601 SO. RACINE AVE., CHICAGO 9, ILLINOIS

PLANTS IN: LOS ANGELES • CHICAGO • NEW YORK

Which CANCO pressure container suits you best?





It's the most complete line in the industry, so you will find exactly what's needed. The Canco one-inch cup opening top, or the individually styled one-piece tops, will accommodate a wide variety of valves and are readily adaptable to all filling and closing equipment in use today. Check these important advantages that add up to substantial economies.

1. **Lower initial cost.** Canco pressure containers cost you less because they're mass-produced on standard high-speed can manufacturing equipment.

2. **Variety of sizes and styles.** Canco now offers you five popular sizes of containers: **3-oz., 4-oz., 6-oz., 12-oz.,** and **16-oz.** — available with either one-inch cup tops, or the one-piece tops, which eliminate costly extra parts in your packing operation.

3. **Canco works directly with valve makers and contract loaders.** This developmental "teamwork" gives you the most economical and efficient package.

4. **Canco has many strategically located facilities.** You're assured of prompt, efficient service in all phases of pressure packaging.

Whether your product sprays, mists or foams, Canco's pressure containers can save you *up to 35%* on your package costs!

COME TO **CANCO** FIRST!

AMERICAN CAN COMPANY

New York • Chicago • San Francisco

controlled packaging*

When this well known manufacturer developed this now famous sun tan product, he looked to the FLUID CHEMICAL COMPANY for his aerosol packaging.

Here at FLUID, we have the technical "know-how," the latest automation machinery, and efficient materials handling equipment to produce on time deliveries - - - all part of the every day "*Controlled Packaging" by FLUID.

As we manufacture no products of our own, you are always assured the personal attention and service which your brands deserve.

For your contract packaging needs, write or phone FLUID *today.*

"First in Contract Packaging"

FLUID

CHEMICAL COMPANY INC.

885 MT. PROSPECT AVE. • NEWARK, N. J.

TELEPHONE HUmboldt 5-2880

PRODUCTS: AEROSOLS—GLASS AND METAL
LIQUID—TUBE—JAR—DRY PACK FILLING
RESEARCH • DEVELOPMENT

FOUNDED 1921

CSMA
May 20-22
Chicago

COVER PICTURE

Mid-year meeting of CSMA in Chicago is expected to draw one of the largest assemblies of aerosol-minded businessmen in history. Top: H. E. Peterson, vice president of CSMA; E. G. Klarmann, president; bottom: T. D. Johnson, moderator of aerosol panel discussion; and C. E. Beach, chairman of the Aerosol Division.

Wayne E. Dorland
Publisher

Edward J. Meier
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Ralph Dorland
Advertising Manager

Robert Garty
Midwestern Representative

JUNE, 1956 **Vol. 1, No. 2**

Subscription Rates: One year, $2.00. Canada and Pan America, one year, $3.00. Foreign, one year, $4.00.

Single Copies: current issue: $0.50. Postage and handling charges for foreign countries on single copies: $1.00.

Published monthly on the 20th by Aerosol Publications, Inc. Publications office: 320 North Sixth St., Paterson 2, N. J. Advertising, Subscription and Editorial Office: Box No. 31, Caldwell, N. J. Advertising rates on application. Closing date for copy — 1st of the month preceding month of issue.

Application for controlled circulation classification has been made at the Post Office, Paterson, N. J.

Address all correspondence to Box No. 31, Caldwell, N. J.

The magazine of pressure packaging

AEROSOL AGE

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HOW TO STAR YOUR PRODUCTS AS AEROSOLS

These Contract To The

Even slow-moving products have been reborn as best sellers when packaged as aerosols. The push-button convenience of modern pressure packaging, and its elimination of loss from evaporation, spillage, and breakage have proved tremendous sales advantages. With production of aerosols now approaching 200,000,000 units yearly, a gain of nearly 4000% in ten years, it's time for even the conservatively minded to start using this appealing new packaging technique.

Not a Cent Is Needed for Special Equipment or Personnel!

Nothing in merchandising could be simpler than giving your products the sales advantages of aerosol packaging. If they can be sprayed, brushed on, dusted or daubed, see any of the Contract Fillers listed here. They have the facilities and skills to take over the entire packaging job—whether you want a small test run or volume production. You won't have to invest a penny in plant or personnel.

Specialization by the Contract Filler makes possible economies you might need months or years to achieve. He has the accumulated experience to guide you in obtaining the right containers, valves and formulations. Call on his help now . . . he is your short-cut to the booming aerosol market.

or further information,
end for our illustrated
echnical manual and
narket data book . . .
'ALL ABOUT AEROSOLS"

The Finest Aerosols are Made with

genetron®

Aerosol Propellants

A propellant for every need

Scores of different types of products have been successfully packaged and merchandised as aerosols with the use of General Chemical's *Genetron* Propellants. They are used alone or in combination to provide the ideal propellant for every aerosol need, every pressure and compatibility requirement, every type of container *Genetrons* include:

GENETRON 12—Dichlorodifluoromethane
GENETRON 11—Trichloromonofluoromethane
GENETRON 12/11 MIXES
GENETRON 320—Dichlorotetrafluoroethane
GENETRON 320/12 MIXES
GENETRON 101—Monochlorodifluoroethane
GENETRON 320/101 MIXES
GENETRON 226—Trichlorotrifluoroethane
GENETRON 141—Monochlorodifluoromethane
GENETRON 100—Difluoroethane (1-1)
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GENETRON DEPARTMENT
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

GC
Allied Chemical

Basic Chemicals For American Industry

Fillers Are Your Short-Cut Rich Aerosol Market!

Contract Fillers

The Contract Fillers listed are equipped to fill aerosols with *Genetron* Propellants and are believed thoroughly qualified. Care has been taken to make the list complete, but there may be others in your area who can serve you equally well.

Aerocide Dispensers, Ltd.
Bethridge Road—Rexdale
Toronto, Ontario

Aero-Fil, Inc.
P.O. Box 274
Franklin Park, Ill.

Aeropak, Inc.
3001 West 47th St.
Chicago 32, Ill.

Airosol Co., Inc.
525 North 11th St.
Neodesha, Kansas

Aerosol Corporation of the South
203 Scott St.
Memphis, Tenn.

Aerosol Methods
Johnson Road
Norristown, Pa.

Aerosol Techniques, Inc.
111 Silliman Ave.
Bridgeport, Conn.

A-M-R Chemical Co., Inc.
985 East 35th St.
Brooklyn, N. Y.

Armstrong Laboratories
421 La Grange St.
Boston 32, Mass.

Associated Brands Inc.
35 Claver Place
Brooklyn 16, N. Y.

George Barr & Co.
3601 South Racine Ave.
Chicago, Ill.
850 East 62nd Street
Los Angeles, Calif.
4747 Bronx Blvd.
Bronx, New York

Bridgeport Brass Co.
30 Grand Street
Bridgeport, Conn.

Bromm Chemical Co.
319 Goodsell St.
Evansville, Indiana

Capitol Packaging Co.
1441 S. Circle Ave.
Forest Park, Ill.

Chase Products Co.
20th & Gardner Road
Broadview, Ill.

Claire Manufacturing Co.
7640 S. Vincennes Ave.
Chicago, Ill.

Cleveland Aerosol Packaging Corp.
(Division of Plasti-Kote, Inc.)
9801 Harvard Ave.
Cleveland 5, Ohio

Connecticut Chemical Research Corp.
706 Bostwick Ave.
Bridgeport, Conn.

Connecticut Chemicals (Canada) Ltd.
Curity Ave. and Hollinger Road
Toronto, Ontario

Continental Filling Corp.
123 North Hazel St.
Danville, Ill.

Edgerton & Riley, Inc.
Muirkirk, Md.

Eveready Pressurized Products, Inc.
1101 Belt Line Road
Cleveland, Ohio

Fluid Chemical Co., Inc.
878 Mt. Prospect Ave.
Newark, N. J.

Gard Industries, Inc.
733 Green Bay Rd.
Wilmette, Ill.

Inland Paint & Chemical Co.
2144 W. 49th St.
Chicago, Ill.

Kan-Jax Chemical Company
P.O. Box 1011, 2500 Summit
Kansas City 41, Missouri

Robert J. Kerr Chemicals, Inc.
9 South Fairview Ave.
Park Ridge, Ill.

LaMaur Products, Inc.
520 Plymouth Bldg.
Minneapolis, Minn.

Lawson Chemical Products Co.
5634 Selmaraine Drive
Culver City, Calif.

Lenk Manufacturing Co.
30 Cummington St.
Boston, Mass.

Modernaire Techniques, Ltd.
115 Michigan Avenue
Buffalo, N. Y.

National Spray Can Filling Corp.
1238 East 14th St.
Brooklyn, N. Y.

New Jersey Aerosol Packaging Co.
108 Ashland Ave.
West Orange, N. J.

Pactra Chemical Co., Inc.
1213 North Highland
Los Angeles 38, Calif.

Par Industries, Inc.
2193 East 14th St.
Los Angeles, Calif.

Peterson Filling & Packaging Co.
Hegeler Lane
Danville, Ill.

Plaze, Inc.
9401 Watson Industrial Park
St. Louis, Mo.

Powr-Pak, Inc.
643 North Ave.
Bridgeport, Conn.

Products Manufacturing
135 Stevens Ave.
Little Falls, N. J.

Puritan Distributing Co.
160 Washington St., Nor
Boston 14, Mass.

Regal Chemical Corp.
115 Dobbin St.
Brooklyn 22, N. Y.

Gene Rose Co., Inc.
1637 South Kilbourne Av
Chicago, Ill.

Schaefer Paint Company
334 West Marion St.
Lancaster, Penn.

Sprayon Products Co.
2075 East 65th St.
Cleveland, Ohio

Stalfort of Penna.
Ford and Washington S
Norristown, Pa.

Stalfort Pressure-Pak, I
319 West Pratt St.
Baltimore, Md.

John Struthers & Co., Lt
5581 Pare St.
Town of Mount Royal
Montreal 16, Quebec

Sun-Lac, Inc.
274 Lafayette St.
Newark, N. J.

Transco Co.
1102 77th St.
Houston 12, Texas

Whitmire Research
Laboratories, Inc.
339 So. Vandeventer St
St. Louis, Mo.

Western Filling Corp.
4151 Bandini Blvd.
Los Angeles, Calif.

Zenith Drug Co.
1 Vesey St.
Newark, N. J.

BRICKBATS and BOUQUETS from the MAILBAG

(All bouquets this month)

Would like to repeat my comments on the first issue. I think it is one of the finest jobs I have ever seen done covering a specialized field such as the aerosol industry.

Eugene L. Rose
GENE ROSE CO. INC.

We know Aerosol Age will be a great success, as this is rapidly becoming a "push button" age and the American public is getting more and more conscious every day of the utility of aerosol products in every phase of living.

Michael Ryan
LEPRECHAUN, INC.

Just received the first issue and at first glance it looks most impressive. The layout and contents are extremely good and I think should draw very favorable comment from those interested in the aerosol industry.

Harvey C. Tull
CROWN CORK & SEAL CO.

Congratulations on your first issue. As of this writing, have not finished reading, but, have gone far enough to say that I believe you have done a good job.

Charles E. Beach
JOHN C. STALFORT & SONS

The first copies of Aerosol Age have just arrived at the plant and created quite a stir of interest. I am anxious to have the opportunity of sitting down with a copy to read it from cover to cover.

Morris J. Root
G. BARR & CO

From the support you have received in the form of advertisements, apparently, the industry was really ready for this kind of a publication . . . The articles look most interesting and I am sure must pack a lot of information for those concerned with aerosols.

Paul Mayfield
HERCULES POWDER CO.

Our May issue arrived this morning and you have our congratulations on getting off to a fine start. A good job well done.

John W. Eldridge
AEROSOL PROCESS CO.

I received the first issue of your publication which indeed was very interesting. I would appreciate the name of the manufacturer of plastic aerosol containers which you mentioned in an article on page 27.

Joseph Parentini
ROURE-DUPONT, INC.

(*Editor's Note*:)—American Cyanamid Co., New York, make the melamine-formaldehyde plastic. Molding of one of the first of these new containers was done by Manufactured Products Co. (formerly Colt Manufacturing Co.) Hartford, Conn.

In the Spotlight this month

- **Metering Valves . . .** Colognes, perfumes, pharmaceuticals and even food products are being packaged in aerosol containers with metering valves. **Aerosol Age** reviews the types of valves available and presents some views of manufacturers and users on the future of metered mists. P. 34.

- **Metal Containers . . .** The three-piece aerosol can with valve staked directly into the perforation at the top may mean lower container cost, broadening the aerosol market. P. 32.

- **Methylene chloride . . .** Offers advantages and savings as a propellant compound. Winston Reed reviews the history of methylene chloride and suggests some plant handling techniques. Use in formulations for oven cleaners and paint removers and as a solvent for production clean-up and line flushing extends its value. P. 27.

- **Labels . . .** Precautionary points for all aerosol containers and a list of instructions covering essential areas of information to be included on labels, should be noted by U.S. and foreign loaders alike. Data assembled for the European market is presented on page 41.

- **Powder Aerosols . . .** Toilet Goods Association is told that the aerosol package is garnering a larger share of total packaged toiletries every year and the trend shows no signs of changing. Victor DiGiacomo, speaking at the TGA convention, gives an up-to-date story on dispensing powder aerosols. P. 50.

- **Insecticidal Aerosols . . .** A review of changing styles in aerosol insecticides, with suggestions on typical formulations for conventional aerosol insecticides, pressurized residuals, and pressurized space aerosols. An expert in the field reviews choices available among knockdown agents, synergists, killing agents, solvents, propellants and filling ratios. P. 24.

CUSTOM FILLING

to your most exacting specifications

When you select Bridgeport Brass Company as your supplier for the custom loading of your aerosol products, you *know* you are dealing with a reputable organization of long-time experience in this specialized field. Backed by extensive research facilities and the most modern equipment, Bridgeport methods insure exacting control of quality and rigid adherence to your most exacting specifications!

Safeguard your good name and the priceless reputation of your product. Select an established, ethical, experienced resource and *unload* the worry and responsibility. Put Bridgeport's long experience to work for you with full confidence in the result.

We will welcome the opportunity to discuss your problems and how we may be of assistance to you. Write or telephone today!

Bridgeport® AER★A★SOL PRODUCTS

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BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN.

SAFEGUARD YOUR GOOD NAME AND REPUTATION WITH BRIDGEPORT BRASS COMPANY

What's new in Aerosols

IN this highly profitable field, the latest, most exciting news is the big upswing in non-toxic aerosols.

Not that the "non-toxics" have ever been out of favor with the buying public, but today they're back with a bang — this time to stay!

Non-toxic aerosols are in bigger demand than ever for farm . . . household . . . and institutional uses. In a word, the reason is this: proved safety and high performance.

Pyrenone* combinations of technical *piperonyl butoxide* and *pyrethrins* assure you of the highest standards of safety and performance.

Pyrenone makes better bombs . . . and better bombs make bigger profits!

For expert technical help in the formulation of a wide range of non-toxic aerosols, contact the nearest office of Fairfield Chemical Division, Food Machinery and Chemical Corporation.

*REG. U.S. PAT. OFF., F.M.C.

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NOW! A.R.C. offers America's Finest
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Now every manufacturer of spray or foam aerosols in metal or glass containers — can take advantage of the research and engineering that makes A.R.C.'s K-38 Valve so outstanding! All the proven advantages of this popular valve have been incorporated in the NEW Improved NYLON K-38 series, headlining A.R.C.'s new fully-expanded line. You get the zip of K-38's "light touch" spray action . . . the smartness of K-38's clean-cut styling . . . the strength of K-38's outstanding construction —plus the versatility of NYLON—in the widest selection of internal meterings to best meet your packaging requirements. Yes, whatever your needs—see A.R.C.— before you buy any valve.
Send today for your complete kit of these new improved NYLON K-38 A.R.C. Test valves, and see the difference they make. Write Department M.
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743 Circle Avenue, Forest Park, Ill. Phone FO 6-4880

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This is not a facetious question . . . rather a very sales-serious one. Impressions are created by our senses and retained in the memory often long after the sharpness of actual events have faded. The space deodorant that scents a theater, hotel, restaurant, lobby, factory or home is quietly and unobtrusively making either pleasant or unpleasant associations in the minds of your customers. If the masking and and reodorizing agent has been carefully selected after exhaustive developmental work in an Aerosol Testing Laboratory . . . chances are excellent that your "silent salesman" is making friends. Such a service is available to you in the D&O Aerosol Department. Let our Aerosol Technicians and expert perfumers help put the *right atmosphere* in your space deodorant!

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ESSENTIAL OILS • AROMATIC CHEMICALS • PERFUME BASES • FLAVOR BASES • DRY SOLUBLE SEASONINGS

WHY Seaquist 750NN AEROSOL VALVE IS BETTER FOR YOUR PRODUCT

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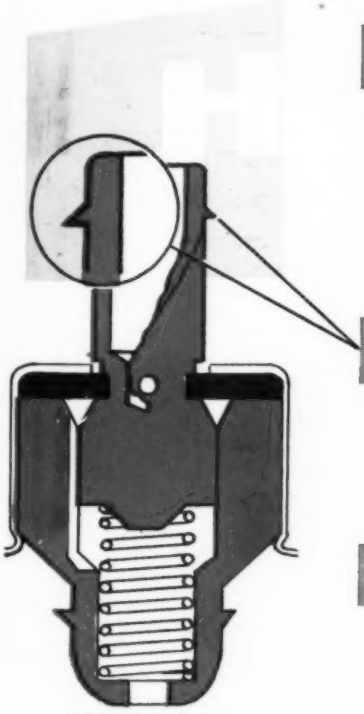
SHAVE CREAMS
HAIR LACQUERS
and other pressure dispensed products



PATENTS PENDING

NYLON CONSTRUCTION

. . . ideally suited for formulas that corrode metal valves, as well as for non-corrosive products . . . eliminates guess work in selecting the right valve for your product.

SEALING & RETAINING RING

Inhibits seepage between stem and button. Assures cleaner handling by the customer. Eliminates lost buttons.

3 CONTROLLABLE ORIFICES

. . . means uniform spray, adaptability to a wider variety of pressure dispensed products. Another good reason why the Seaquist 750NN Aerosol Valve is better for your product.

For your pressurized product, look to Seaquist for laboratory assistance in tailor-making it for greater economy, top performance and wider consumer acceptance.

Seaquist MANUFACTURING CORPORATION
CARY, ILLINOIS

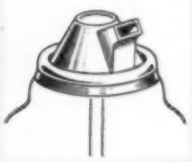
A PIONEER IN AEROSOL VALVES

a complete line of safe, dependable aerosols...

Thanks to VCA *Quality Valves*

for every need....
a Standard VCA valve!

GLASS—Sensational new EMSON METERED VALVE—for cosmetics, pharmaceuticals, etc.



FOAM—all aerated products.

FOAM with the exclusive "twistlok"—for soaps, shampoos, creams, cosmetics, foods, etc.

STAINLESS STEEL—Nylon stem—for hair lac, shave cream, pharm., cosmetics etc.

ALUMINUM—with the Metered valve—for all compatible products.

VCA OFFERS YOU BIGGER ADVANTAGES!

Experienced engineering and *exacting standards* in design, research and production of all standard and custom VCA valves, mean the difference between wasting dollars and making profits. Reorders are automatic for aerosols made with VCA quality valves.

VCA Quality Features:

- Modern design—sales appeal
- Tested to perfection
- Fingertip operation
- Simple, trouble-free action
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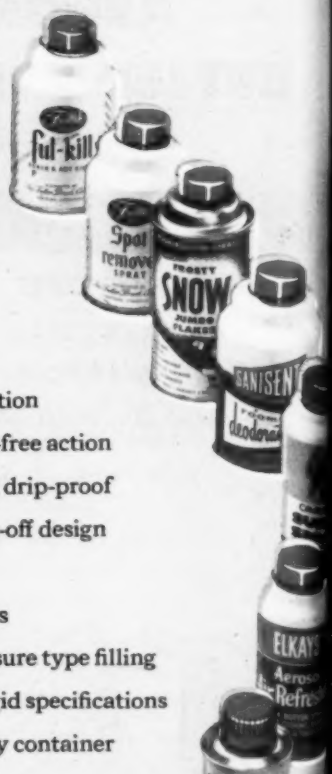
- Immediate shut-off design
- All the colors
- All the flow rates
- For cold or pressure type filling
- Parts built to rigid specifications
- A valve for every container



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VCA specialized engineering service immediately available to solve your aerosol packaging problem.... big or small. No obligation. Inquire!

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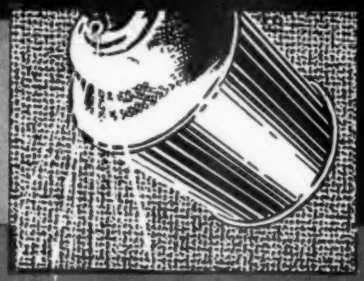
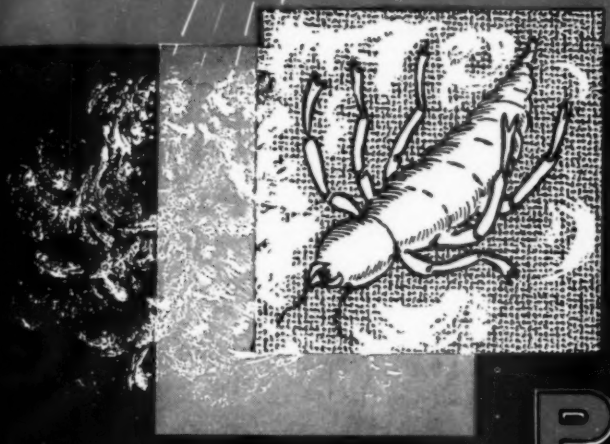
Send specificati
for sample
valves and pric
Literature availa



for SURE KILL *formulations*



in your aerosols use

PRENTISS

PEST-TESTED insecticidal concentrates.

Whether you require individual ingredients or completed formulations for your aerosol, PRENTISS is ready to meet your requirements. Our technical staff is at your command to aid you in marketing your aerosol.

Rely upon PRENTISS to give you the *exactly right* insecticidal concentrate for your aerosol to control home and garden pests.

Try these PRENTOX PEST-TESTED Products

Chlordane Concentrates · DDT Concentrates
Lindane Concentrates · Pyrethrum Concentrate
Pyronyl Concentrates

Send today for information on the complete line of Prentox Pest-Tested Insecticides for use in aerosols

PRENTISS DRUG & CHEMICAL CO., INC.

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2 in 1 punch*

* for the quick ***knock-down*** and positive ***stay-down*** results.....

specify GEIGY METHOXYCHLOR

for your aerosol and spray formulations

Methoxychlor is a safe, economical, chemical relative of DDT. Its low toxicity to man and animals, combined with its long residual toxicity to insects makes it an ideal insecticide for use in aerosol formulations.
GEIGY METHOXYCHLOR is compatible with pyrethrins, allethrin, and piperonyl butoxide.

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Designed for use in the preparation of household sprays, dai barn sprays, aerosols and other products where small amounts methoxychlor are desired in the finished products.

GEIGY METHOXYCHLOR "90"
A concentrated methoxychlor product for use in the formulati of methoxychlor sprays and aerosol solutions.

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Contains 80% technical Chlorobenzilate for formulation of dilu dust mixtures and aerosol solutions. Chlorobenzilate is extreme effective in controlling many species of mites attacking orn mental, greenhouse and nursery stock.
*"CHLOROBENZILATE" is the brand name for miticides and acaricides s by Geigy Agricultural Chemicals, division of Geigy Chemical Corporati

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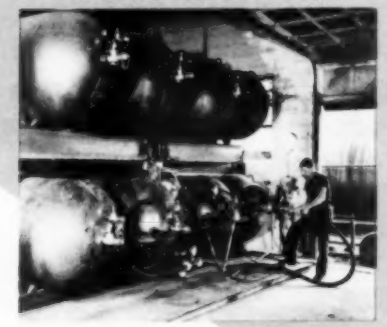

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Editorials

PERHAPS it is only natural for old established firms in any commercial field to resent what they probably think of as the intrusion of new faces in areas which they have staked out for themselves. We get the feeling, however, that preoccupation with new competition, and excessive concern regarding it, may be rather overdone in the aerosol field.

It seems to be characteristic of the American business scene to think of one's competitor too often as "that price cutter," particularly if his is a new face and he is trying to get started and build up some volume by trimming a corner or two. But in a competitive economy like ours such aggressive competition is a phenomenon that, we can be thankful, will never disappear. That's the way our economy functions.

Perhaps, too, it is inevitable that in a relatively new field like aerosols there should be a lot of legal activity. As with chickens in a barnyard, the pecking order must be determined, — who can peck whom, and in what order. It will take a while to get the situation all shaken down, to determine who had priority, whose patents are valid and who is responsible when something goes wrong and that big shipment comes back as "returns."

We might just as well reconcile ourselves, however, to the fact that lots of competition must always be expected in any new, profitable and expanding field. It's a healthy sign. If the industry's volume were still just five million units annually, instead of close to three hundred million, we might still have just one propellant supplier, as was once the case, two or three valve manufacturers, one manufacturer who would be supplying containers purely as an "accommodation," and three or four of the original group of custom packagers would be well able to handle all the demands for this type of service. Along with stability we would have a nice dead industry, — with no competition to worry anyone.

Competition . . . Don't the economists for the Sunday supplements always refer to it as the "life of trade"? We should be glad we have it, and lots of it. We repeat: It's a healthy sign. A sign that some one has been making money and some others want in. A sign that the industry is still expanding, and that today's new competitors will themselves have even newer competitors tomorrow. And no one doing a really good job and turning out a top product needs to have too much concern about the effect competition may have upon him in a dynamic industry like this one.

* * *

THERE is still much work to be done in the definition of terms in the aerosol industry. With a big job to do, the industry's nomenclature experts have moved very slowly, — too slowly. As one industry figure suggested, they have defined just one thing, — aerosols — and even this definition leaves much to be desired.

A revision of the present definition might well merit early consideration. The present form limits aerosols to products using a liquefied gas as the pressure-producing agent. But let's not kid ourselves. Even though by this definition whipped cream may not accurately be described as an aerosol, it is still an aerosol to the public, who wouldn't know a liquefied gas from a compressed gas anyhow.

And whether pressure-packed products employ one propellant or another, they are still packed in aerosol containers, use aerosol valves, and puff out when you press the button. It's our feeling about definitions that they must keep abreast of their industry, which in this case is expanding.

As a matter of fact, if you want to be really technical about the matter, to the physical chemist, the only aerosol is a smoke.

Modern trends in INSECTICIDAL AEROSOLS

THE first insecticidal aerosols were produced in the United States in the early 1940's, and were entirely for military use. Shortly after the end of the war, insecticidal aerosols made their appearance on the domestic market and have been a very active and steadily growing product ever since. They continue to grow in quantity and quality, and their increasing diversity has been a stimulus to the insecticide industry and to the package market.

Insecticidal aerosols have now been on the domestic market for close to 11 years. This market is steadily expanding along new lines, and is daily interesting new merchandisers, new clients and new users. There still are many questions asked by salesmen, by purchasers and by consumers, the most frequent being "why are there so many ingredients in an aerosol insecticide formula," or "what makes an aerosol work"? It might be interesting to discuss in a very general non-technical way some of the questions which are commonly asked in this connection.

Aerosols may be produced in several ways; however, for the purpose of this discussion we are considering primarily the insecticidal aerosols which are oil solutions and which employ various propellants in their formulation. Currently, there are several general categories in which the insecticide packages fall, namely the "true" aerosol, the pressurized residual package, and more recently the pressurized space aerosol.

By definition, an aerosol is composed of numerous fine particles of liquid suspended in the air. In an insecticidal aerosol, all the particles should be smaller than 50 microns in diameter and 80% of the particles should be less than 30 microns in diameter. (A micron is one thousandth of a millimeter.) The small size of these particles allows them to remain suspended in the air for long periods of time; and thereby to be effective against insects during the extended period.

A Pressurized Residual is designed to produce a coarse wet spray deposit on surfaces. It is defined as having ten per cent of the particles under 20 microns in diameter, the balance being largely above 50 microns or more in diameter.

A Pressurized Space "Aerosol" or push button insect spray produces particles ranging in size from about 10 microns to 80 microns, with most of them averaging about 25 to 30 microns. This type spray is similar in particle size to a good oil spray properly atomized.

Obviously, a wide range of particle sizes can be produced by varying the filling ratio, the amount and the pressure of the propellant, by varying the valve orifice size, by varying the composition of the insecticidal formulation, and by varying the density and/or viscosity of the formulation. Other variations can be introduced by the addition of an ingredient such as methylene chloride which acts as both a solvent and a propellant component. The particle size of an insecticidal aerosol is extremely important for this determines how long they will float in the air and, therefore, how long the insect will be in contact with the toxicant.

The first insecticidal aerosol consisted of pyrethrum extract 20% and propellant 12. The next consisted of:

5.0% Pyrethrum Ext. 20%
2.0% Refined Sesame Oil
93.0% Propellant 12

100.0%

This formulation gave a very fast knockdown on mosquitoes and flies, due primarily to the large amount of pyrethrum in the formula. This type aerosol operated at approximately 70 to 80 lbs. per square inch pressure and delivered particle sizes conforming to a true aerosol.

Later products contained less pyrethrins, namely:

2.0% Pyrethrum Ext. 20%
8.0% Refined Sesame Oil
90.0% Propellant 12

100.0%

by George Hartz
Specialty Sales Manager
Olin-Mathieson Chemical Corp.
John Powell & Co. Div.

These were found to give correct particle size for an aerosol. They were also less expensive, and extended the limited supply of pyrethrum.

Subsequent military formulations employed pyrethrum extract 20%, DDT, cyclohexanone as a solvent for the DDT, and lube oil. This formulation was used at a 15/85 ratio. In this case the cyclohexanone was used as the solvent for the DDT, and the lube oil was used as a partial solvent and to contribute the proper particle size to the aerosol formulation when suspended in the air. The formulation was:

3.0% DDT
2.0% Pyrethrum Ext. 20%
5.0% Hydrocarbon Oil (Lube Oil)
5.0% Cyclohexanone
85.0% Propellant 12

100.0%

The above formulations were all packed in the large, heavy containers which necessarily made an expensive package.

Shortly after the war, the can companies did an excellent job of developing the inexpensive beer type aerosol cans, and the valve manufacturers made many contributions to the development of excellent valves. The use of propellants 11 and 12 in the 50/50 combination also reduced the pressure from 70 or 80 lbs. to 35 or 40 per square inch, an essential prerequisite to the use of the lighter and less expensive containers. The development of the 11-12 combination was a very helpful step.

This change in the valves and also the propellant was accompanied by corresponding changes in formulations which were needed to produce the correct particle size under the new conditions of 35 to 40 lbs. of pressure and also the newer valves.

The filling ratio, which is the ratio between the amount of insecticidal formula used and the amount of propellant, is an important factor in the development of the correct particle size and function of an insecticidal aerosol. The first formulations were at a 7/93 ratio, later changed to a 10/90 ratio and still later to a 15/85 ratio as formulation changes made this necessary or desirable.

Some time later, the ratio was again changed from 15/85 to 20/80. By varying the formulations, compositions were produced which made a very good aerosol at the 20/80 ratio, and also decreased the price accordingly. It was felt for some time by many people, that the 15/85 ratio represented a very good aerosol formulation, in fact preferable in most cases to a 20/80 ratio. Many of the more expensive formulations still employ the 15/85 ratio; however there are also many formulations available in the 20/80 ratio and these are now considered by most to be almost the equal of the 15/85 ratio formulations.

Aerosol Insecticide Formulation

Let us look at the composition of an average aerosol formula. It consists of a knockdown agent or agents, a synergist, a killing or toxic agent, a solvent or solvents for the toxicant, and sufficient insecticidal base oil to complete the formula to the desired filling ratio.

Knockdown agents quickly affect, paralyze or knock down the insect, so it can no longer bite or harm people or animals. The quick knock down allows the slower toxicants like DDT or methoxychlor to complete the kill.

The synergists assist and work with the expensive knockdown agents, pyrethrum and allethrin, thus reducing the cost while still maintaining effectiveness.

The toxicants DDT and methoxychlor are solids. They require solvents such as methylated naphthalenes or methylene chloride to dissolve them and keep them in solution in the formula, particularly when the formula is chilled during the filling step.

The insecticide base oil completes the formula to the desired filling ratio. It also acts as the vehicle for the toxicants and contributes along with the methylated naphthalenes, to the formulation of correct particle size.

Knockdown Agents

Pyrethrum—Preferred by most as the best knockdown agent, but expensive. Used in the most expensive formulas — usually .1 to .2%, sometimes up to .5% for special knockdown effect. Effective against both flying and crawling insects.

Allethrin—Widely used, less costly than pyrethrum, usually .1 to .2%, sometimes higher. Good for flying insects, not as effective as pyrethrum against crawling insects. Used in medium and lower cost formulas because less expensive than pyrethrum. The military aerosol uses .6% allethrin, + DDT.)

Lethane—A thiocyanate, used in medium and lower cost formulations since 1950.

Lethane—A thiocyanate, used in medium and lower cost formulations since 1950. Effective and inexpensive, usually used at 1% or 2%; rarely higher. Mostly used with .1% of pyrethrum or allethrin. Usually requires perfuming.

Thanite—Also a thiocyanate similar to Lethane. Generally used at 1% or 2% along with .1% of pyrethrins or allethrin. Usually requires some perfuming. General price level similar to Lethane. Effective and inexpensive.

Synergists

A synergist assists and works with the knockdown agent. Some synergists have insecticidal value of their own in addition to contributing to in-

creased effectiveness of the knockdown agent. Pyrethrum and allethrin are expensive, approximately $50.00 and $32.00 per lb. respectively. Synergists sell at only about $1.65 to $4.50 per lb., and when used in combination with the pyrethrins or allethrin, materially reduce the cost while still maintaining effectiveness.

Sesame Oil—The first synergists used in the wartime aerosol bomb. After the war sesame oil extractives, including sesamin, were widely used. Currently of interest is sesamolin and possibly other compounds.

Piperonyl Butoxide—A good synergist, and also possesses insecticidal activity of its own. Widely used, usually .25 to .5% — same at .75% and 1.0%. Sometimes used in pyrethrins — piperonyl butoxide combinations, without DDT or other toxics. Easily soluble in base oils.

Sulfoxide — Similar to piperonyl butoxide, and used in same way. Also similar in price.

Synergist 264—Also a widely used synergist, usually at .25 to .5% or 1.0% levels. Soluble in base oils.

Killing Agents

DDT—Widely used as toxicant and killing agent in combination with suitable knockdown ingredients and synergists. Requires solvents. Inexpensive, 25-30¢ lb.

Methoxychlor—used like DDT, sometimes in combination with it. More expensive than DDT. Assists in knockdown effects. Considered somewhat less toxic than DDT. Requires solvents.

Chlordane—Used as a residual in pressurized formulas against crawling insects. Is not used in true aerosols.

Lindane—Some use as residual in pressurized formulas.

Dieldrin—Interesting for use as a residual for crawling insects, alone or in combination with knockdown agents or other residual components in pressurized residual formulas.

Strobane—Interesting as a toxic agent in both space and residual applications. Readily soluble, needs no auxiliary solvents and so can be used in "odorless" formulations. Somewhat similar in effect to DDT and methoxychlor. Used at 2% levels along with knockdown agents and synergists in space aerosols. In moth-proofing residuals, odorless base oils may be employed as solvents. Used at 4 to 5% level for mothproofing.

Perthane—Similar to DDT and to Strobane. Also interesting because it is soluble in odorless base oils without needing an auxiliary solvent. Used at 2% levels in space aerosols, and in moth proofing residuals at 4-5% level.

The author of this article is a veteran of 28 years experience in insecticides and essential oils. He was with Seil Putt and Rusby from 1930-40, where he worked on pyrethrum and rotenone. Chief chemist of John Powell & Co., from 1940-50, he conducted research and development work on pyrethrum insecticides, aerosols, etc. Since 1950 he has been specialty sales manager of aerosol formulations and specialty products for the Powell Division of Olin Mathieson Chemical Corp.

Solvents

Methylated

Naphthalenes — Methylated naphthalenes or aromatic petroleum derivatives such as 544C, Velsicol AR50 or HAN are widely used. Good solvents, they have considerable odor, but are relatively inexpensive. Act as mutual solvents.

Odorless

Base Oil—Odorless insecticide base oil is used to make up the balance of the formula. Inexpensive. Is frequently used without auxiliary solvent in some moth proofers with Strobane or Perthane.

Isoparaffins — Isoparaffinic solvents. Recently, completely odorless isoparaffins have become available and are very interesting, relatively inexpensive and are enjoying use as an odorless component in the moth and space formulas which use the soluble Strobane or Perthane. When used with methylene chloride, DDT and methoxychlor, can also be incorporated into "odorless" space formulations.

Methylene

Chloride—Methylene chloride is a good odorless solvent, often used in place of methylated naphthalenes. Also used in conjunction with Propellant 12 as a solvent-propellant combination. Currently widely used in the "odorless" space aerosols or push button pressurized formulas.

Propellants

Freon 12, the propellant used in the first aerosol bug bombs, has a vapor pressure of 70 lbs. per square inch in gauge at 70°F. This relatively high pressure required the use of heavy gauge cans which were expensive.

The development of the mixture of propellant 11 and propellant 12, which in a 50/50 mixture gave 35 to 40 lbs. square in. gauge, was considered to be moderate, safe and effective, and enabled the inexpensive beer can package to be used. In quantity production, this greatly reduced the cost of the package by allowing the use of the less expensive 11-12 propellant mixture. Also, formulations were changed to 15/85 and 20/80 ratios, which further decreased the price and still gave very effective performance.

Recently some pressurized spray packages in 60/40 or 65/35 ratios have been using 35-40% propellant 12 plus methylene chloride as the propellant mix. Carbon dioxide is another interesting possibility as a propellant, on which work is continuing.

Pressurized Residuals

The Pressurized Residuals give coarse, wet sprays designed to moisten surfaces and to penetrate cracks and crevices. Since only about 10% of the particles are under 20 microns in diameter, very little of the toxicant actually escapes into the air. We can therefore use chlordane up to 3% and lindane and dieldrin to .5% in these residuals, although at this time they are not approved for use in space aerosols.

(Turn to page 70)

Methylene Chloride in Aerosol Production

Part 1

by Winston H. Reed
Aerosol Consultant, Aerosol Process Co.

Dr. Reed, in this paper, reviews the history of the use of methylene chloride in aerosol production, discusses some of its properties of special interest to the production department, and presents some notes on plant handling techniques.

In later papers the author will describe methods used for recovering methylene chloride from aerosol package salvage and also will discuss the application of methylene chloride in production and in formulation room practice.

METHYLENE chloride as a non-flammable, essentially non-toxic solvent offers advantages and savings to the efficient, cost conscious producer of many types of aerosol products. These advantages have led to its extensive use in this rapidly growing industry and many millions of successful aerosol packages containing methylene chloride as a propellant component have been produced.

History of the Product

Early in the development of the aerosol industry, methylene chloride was suggested to replace trichloromonofluoromethane as a solvent companion for dichlorodifluoromethane. The latter two compounds will be referred to in this paper as Propellant 11 and Propellant 12 respectively.* In propellant mixtures, methylene chloride is suitable for lowering both pressure and cost and for obtaining better solvency characteristics than those found in the straight Propellant 11-12 system.

Goodhue, Fales and McGovern[1] in 1945 mentioned the use of methylene chloride-propellant 12 mixtures as propellants and Fulton[2] in 1948 also discussed this and other propellant combinations employing methylene chloride. Methylene chloride was put into production use in aerosol propellant formulations by the Aer*A*-Sol Division of Bridgeport Brass Co. in that same year. It is now used by various manufacturers in a variety of non-aqueous aerosol products including insecticides, room deodorants, moth proofers, snows, paints, oven cleaners and paint removers.

Methylene chloride, because of its excellent solvent action on the active agents of many aerosol formulations, is often used as a carrier solvent for the concentrate in a two stage fill. To the concentrate solution carrying all or part of the final desired amount of methylene chloride, either Propellant 12, Propellant 12 — Methylene Chloride or Propellant 11 — 12 mixtures is added on the filling line to produce the desired final propellant and formula concentrations.

Chemical Properties

Data on methylene chloride of particular interest to the aerosol production man and pertinent to this discussion are given in Table I.

The corresponding data for Propel-

Properties of Methylene Chloride and Propellants 11 and 12

	Methylene Chloride	Propellant 11	Propellant 12
Formula	CH_2Cl_2	CCl_3F	CCl_2F_2
Mol Weight	84.94	137.38	120.92
Boiling Point, °F. at 1 atm.	103.6	74.7	—21.64
Gauge Vapor Pressure, psig at 70°F.	—7.60	—1.30	70.12
Gauge Vapor Pressure, psig at 130°F.	8.9	24.26	180.2
Specific Gravity at 70°F.	1.327	1.485	1.323
Liquid Density, lbs./gal. at 70°F.	11.06	12.35	11.04
Gallons per Pound	0.0904	0.0810	0.0906
Current Bulk Price, ¢/lb. (tank truck loads, dlvd., Eastern U.S.)	11.25	21.6	25.6
Same in Dollars per gallon	1.243	2.665	2.826
Pounds per Dollar	8.89	4.63	3.90
Gallons per Dollar	0.805	0.373	0.354

*Available as:
Genetron 11 and Genetron 12 from General Chemical Div., Allied Chemical & Dye Corp.
Freon 11 and Freon 12 from "Kinetic" Chemicals Div., E. I. Du Pont de Nemours & Company, Inc.

lants 11 and 12 are included for comparison. More complete data on the physical properties of methylene chloride may be found in some of the trade bulletins.[3] Properties of methylene chloride propellants and their use in aerosols, with particular emphasis on solvent action toward plastics, fabrics and surface coatings, are to be presented in a forthcoming technical paper by Skrypa and Shannon.[4]

Comparisons of the boiling points, the vapor pressures at 70°F. and 130°F., the specific gravities and the liquid densities at 70°F. from the data of Table I are also shown graphically in Figures 1-3.

Comparisons of the pounds per dollar and the gallons per dollar reveal rather strikingly both the price and density advantage of methylene chloride over Propellant 11 as shown graphically in Figures 4 and 5.

Propellant 11 has a tendency to hydrolyze sufficiently in aqueous aerosol systems to cause corrosion trouble in metal containers and to affect adversely certain formulations even in glass or plastic containers. Since methylene chloride has a hydrolysis rate greater than Propellant 11, it should not be used in aqueous or related systems where hydrolysis action may be anticipated, and for the same reason storage and handling equipment should always be kept dry.

The high solvent action of methylene chloride and its tendency to swell some elastomers have to be taken into consideration in the selection of seals, packing and lubricants in plant handling equipment. The same is true in the choice of formulations for specific products and in the selection of aerosol valves for use with these products. In some cases, however, moderate swelling of gaskets and valve parts has been found to give tighter seals and better performance. Quite an extensive background of practical experience in recommended practice has been accumulated on these topics by the producers of methlyene chloride, the aerosol loaders and the aerosol valve manufacturers.

It should be noted that in propellant blends with Propellant 12, or with Propellants 11 and 12, both the solvent action and the swelling of certain elastomers attributable to methylene chloride are considerably less than with the pure material and are in many cases roughly proportional to the concentration of methylene chloride present.

Safety Precautions

Certain safety precautions should be taken with any chlorinated hydrocarbons or fluorochlorohydrocarbons. They can all form toxic vapors in the presence of flames. The vapors of methylene chloride are heavy and while the material has a low toxicity, suitable care should be exercised to have good ventilation if it is being used in a confined area. For more complete information on toxicity and recommended handling procedures the user should consult the trade bulletins.[3]

Plant Handling Practice

Methylene chloride has a long record of use by the chemical, paint, drug and metal cleaning industries as a useful solvent and has found application as a refrigerant. While the use of the material offers no special difficulties to companies experienced in the handling of such solvents, aerosol production does have its own set of requirements. It is therefore of interest to consider techniques and equipment found useful in aerosol plant practice.

A busy aerosol filling line has an astonishing appetite for chemicals. Even a moderate capacity filling line, turning out fifteen thousand 12 ounce aerosols per day, will require nearly six tons of ingredients of which 4 to 5 tons may be propellant. Consequently the economies in price and lower handling costs have led to a growing trend toward bulk storage of the major propellants and solvents by the larger fillers. Methylene chloride may be of value as a propellant component or solvent for both the small and large capacity aerosol producers and its bulk storage is worth careful evaluation by even the smaller capacity plants. For that reason bulk handling is in this discussion.

Yard Handling

The standard shipping containers for methylene chloride are 55 gallon steel drums (I.C.I. Specification 5) containing 600 lbs. net; 4, 6, 8 and 10 thousand gallon steel tank cars (I.C.I. Spec. 103) containing 44,000, 66,000, 88,000 and 110,000 lbs. respectively; and tank wagons containing 11,000 to 33,000 lbs.

Methylene chloride at 70°F. has a liquid density of 11.06 pounds per gallon and a boiling point of 104°F. Its vapor pressure at 120°F. is only 5 psig and at 130°F. is 8.9 psig. The material can therefore be handled below its boiling point throughout most of the year under most normal conditions.

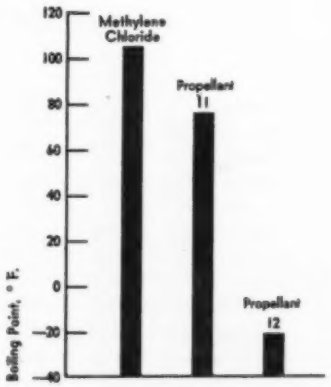


Fig. 1. Boiling Points at Atmospheric Pressure

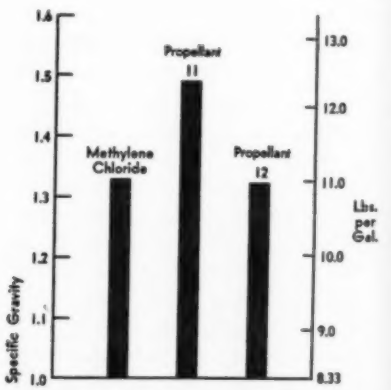


Fig. 2. Liquid Densities at 70°F.

Much useful information on bulk handling procedures for propellants can be found in the trade literature[5, 6] but it should be kept in mind that pressure tanks are not required for methylene chloride storage. It can be handled in all common construction metals except aluminum.

Tank cars can be unloaded readily using a centrifugal type pump with flooded suction. It is good practice to use a vapor return line from the receiving tank back to the tank car or wagon. In some cases a breather tube with a silica gel (Solvabead, Socony Vacuum Co.) drier has been employed. It is recommended that the drier, whether silica gel or calcium chloride, should contain a visual indicator. Where a drier is used, it should be *carefully checked* to insure it is in good condition to do a job. This may appear to be an obvious precaution, but it is occasionally overlooked in practice. As in the case of all propellants, hoses, pipe lines, pumps and containers should be dry and precautions observed to keep them dry especially when the handling is done out doors in wet weather. For temporary use in transfers ordinary rubber hose is found to be satisfactory.

Safe Storage Practices

Drum and tank storage procedure for methylene chloride follow the practice found with any other nonflammable, moderately toxic solvents of similar volatility. As previously stated, the vapors of this material are similar in behavior to the other chlorofluorohydrocarbon propellants and will form phosgene in the presence of free flames. Storage should be away from areas where such conditions might exist. Methylene chloride vapors are heavier than air and the recommended toxicity limits in air are 500 ppm. Adequate ventilation is therefore highly important.

Since the material is non-flammable, both indoor and outdoor tank or drum storage are used. In one case a buried fuel oil tank has been employed successfully for storage after careful cleaning. Outside tanks can be cooled in summer by external water sprays. Internal cooling or steam coils can be a source of water contamination and hence corrosion troubles if leaks occur.

Where a tank is cleaned for storage of methylene chloride, if it is being steam scrubbed or has contained water or alcohols, it should be dried thoroughly before filling with methylene chloride and a check made to be sure that no sight glass or drain line has been left with water or sediment in it. Before putting a newly cleaned and dried tank into service, the tank should be flushed out with several repeated washings with a reasonable amount of methylene chloride until a clean clear wash liquid is obtained. A good precaution is to start with clean and dry tanks, filters, lines and pumps, then to keep them that way.

One methylene chloride producer uses steel storage tanks 9 feet in diameter by 27 feet long with a capacity of 13,000 gallons. These tanks are designed for 30 psig and are equipped with 6 inch B. S. & B. monel rupture disc assembly No. 7, (Black, Sivall & Bryson, Inc., Kansas City, Missouri). Vents on these tanks are manually controlled with cast iron valves, equipped with Crane Co. CR-13 trim.

A suitable filter and drier should be used in the delivery line from the storage tank since it is most important in aerosol products to have the formulation dry and free of sediment. Some aerosol loaders use a vent tube with drier and a 15 psi check valve in the line. For the larger capacity aerosol fillers, use of an activated alumina drier, through which all of the final propellant passes, except that portion used as a solvent for the concentrate, is considered good practice, whether or not the propellant mix contains methylene chloride.

Pumps and Packing

Centrifugal pumps are in general use for methylene chloride and should be under positive head, for with any solvent in this boiling point range it is otherwise easy to get vapor lock. One user has found Gould Jet-

(*Continued on page* 75)

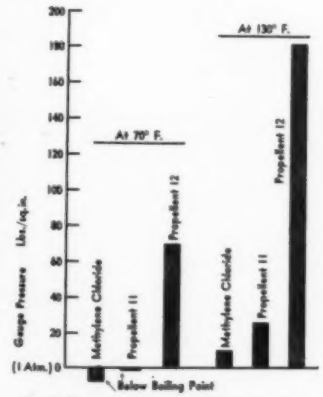


Fig. 3. Vapor Pressures at 70°F. and 130°F.

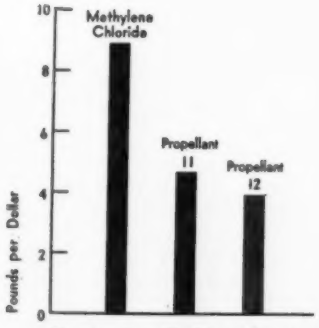


Fig. 4. Pounds of Propellant per Dollar at Current Bulk Prices.

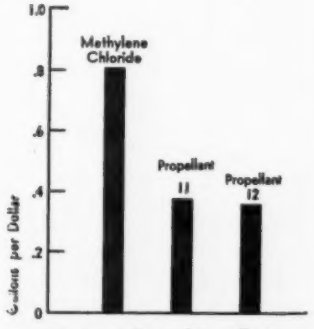
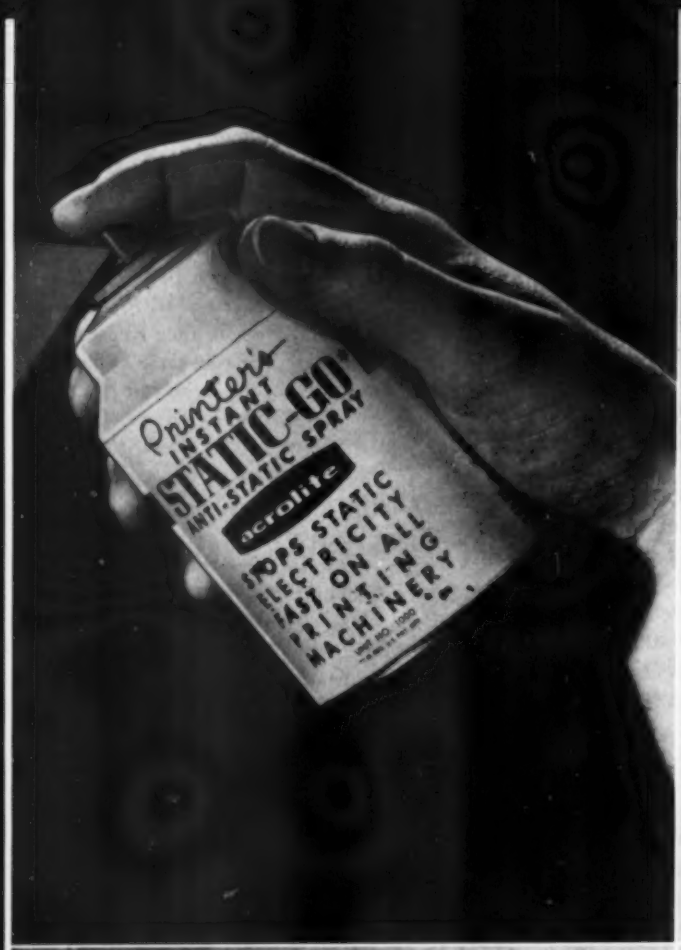
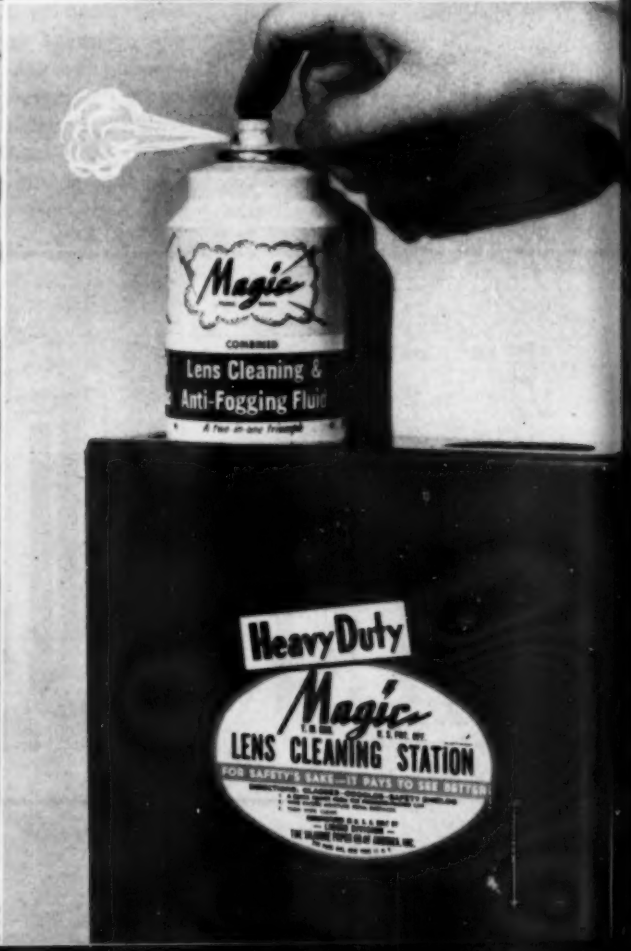


Fig. 5. Gallons of Propellant per Dollar at Current Bulk Prices.


Printer's
INSTANT
STATIC-GO
ANTI-STATIC SPRAY
aerolite
STOPS STATIC ELECTRICITY FAST ON ALL PRINTING MACHINERY

New Discovery!
Raid
House & Garden
BUG KILLER


Magic
COMBINED
Lens Cleaning &
Anti-Fogging Fluid
Heavy Duty
Magic
LENS CLEANING STATION

New Products and Packages

Static-Go, a new aerosol for static elimination, from Acrolite Products, Inc., West Orange, N. J., is designed for use by the printing industry. It is sprayed on the press tympan, undepacking of the cylinder and on other moving parts. The product is greaseless, odorless, and non-flammable.

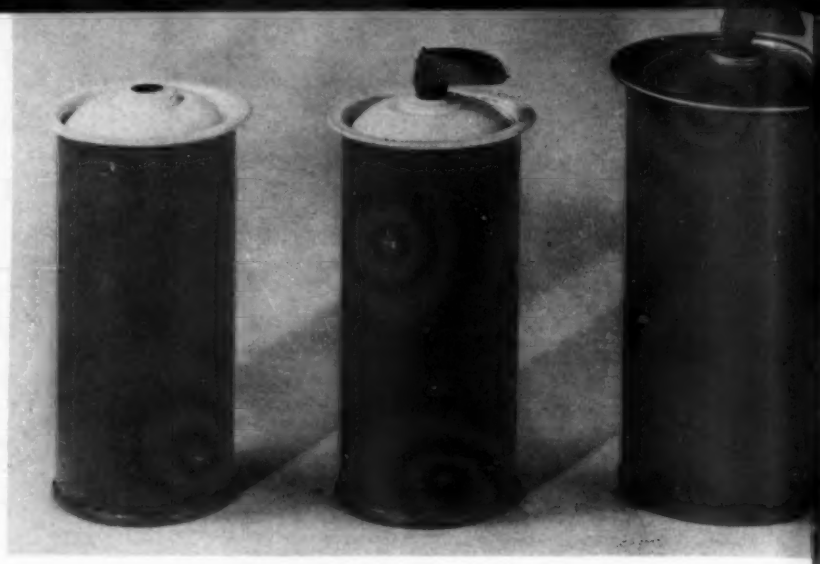
Johnson's Wax has introduced a new type of insecticide called **Raid** in the southern U. S., and plans to extend distribution in the north this month. Packed in a 12 ounce aerosol can, and retailing at $1.59, the unit is said to be enough to clear 60 average size rooms, destroying roaches, centipedes, spiders, silverfish, bedbugs, fleas, carpet beetles, ants, flies, etc.

J. E. Doyle Co., Cleveland, has recently marketed a new product **Statikil,** packed in a 12 ounce aerosol can. It sells for $3.00 each. The product which, is said to contain no mineral oils, radium, mercury, or harmful acids, has a number of uses: eliminates static in the printing industry; used in bag, envelope and box production: used in processing plastic sheets, cellophane, etc.

Hep Insect Repellent is being promoted specifically to the barbecue, vacation, outdoor sports, garden, automotive and infant market this year, by Bostwick Laboratories, Bridgeport, Conn. More exposure with shorter bathing suits means more exposure to insects, says the company. The five ounce can retails for 98 cents.

Magic Lens Cleaning and Anti-Fogging Fluid, packed in a Crown 12-ounce Spraytainer, is a new product of The Silicone Paper Co. of America, Inc. A safety eye-protection cleaning station was assembled around the aerosol can to eliminate the pumps used by previous lens cleaning stations. The paper dispensing cabinet locks the aerosol can in place. About 1,400 applications per can are claimed for the product.

Spray Graph, manufactured by American Resin Corp., Chicago, has now been made available in 6 ounce aerosol containers. The graphite spray is for application to both metallic and non-metallic surfaces.



The three-piece aerosol can has the valve staked directly into a perforation in the top end (left).

Changing Requirements for METAL AEROSOL

AEROSOL products have been packed primarily in metal containers since they were first introduced on a large scale during World War II. The basic reason is that metal packages have the strength necessary to withstand the pressures built up within the container. The first containers were of the high pressure type, packed at a pressure of 70 p.s.i. gauge at 70°F. These requirements necessitated the use of a strong container formed by brazing together two heavy steel shells. Although the convenience and effectiveness of this type of package assured its popularity, it was evident that a less expensive package was needed for the mass market and for packing less costly products.

As wartime restrictions eased and the American public became aware of the new conveniences offered by aerosols, the race was on to learn how these new products could be exploited to the greatest extent. Industrial research came up with a cheaper, light weight, disposable can for household use. The studies quickly led to the adoption of a drawn sheet metal can and then to the development of the economical fabricated three or four piece container.

A wide variety of commercial materials are available for the fabrication of such a container. Strict limitations, however, on the choice of materials and structural features of the package are imposed by necessity for compliance with regulations promulgated by the Federal Interstate Commerce Commission which governs distribution of containers of compressed gases.

Just as the old heavy steel cylinders have been made uneconomical, the aerosol container of today is continually being improved through studies of the product and performance requirements. To the uninitiated, a "tin" can is a single entity, but to the packaging technologist a can represents a combination of materials in which a deliberate choice has been made regarding each of these items: (1) base steel composition, (2) tin coating weight, (3) plate hardness, (4) plate thickness, (5) enamel coating, (6) end sealing compound, (7) solder composition, (8) seam construction, and (9) end formation. The primary purpose of studies of container performance is to determine that the product will reach the retail customer with a standard of quality that will assure his satisfaction and will encourage repeat sales.

By the employment of properly controlled test procedures the can technologist is able to evaluate product and container requirements to a fine degree. It is a wasteful expense for a packager to purchase a container that will last five years if he knows that under normal merchandising practices his product inventory will go through retail handling in two years or less. Money is uselessly spent for 1.25 lb. or 0.50 lb. tin plate,* if 0.25 lb. plate will do the job. Similarly, a company can easily spend an extra fraction of a cent per can by using a double coated enameled can when carefully conducted experiments might prove that a single coat of a properly chosen enamel would be adequate. Even at moderate line speeds of 50 cans per minute this might amount to $70 or $80 a day spent unnecessarily.

The choice of the proper can may not be simplified by selecting a specific container for a class of prod-

*Tin plate is manufactured in coating weights of 0.25 lb., 0.50 lb., and 1.00 lb. for electrolytic plate, and in heavier weights of hot dipped plate. Tin coating weights are designated in pounds of tin per base box, an industry term for plate of a sufficient area to cover 31,360 square inches.

ucts. Within each class there is a wide variation in formulations, and consequently many differences in the container requirements. Sometimes it is not only a matter of custom fitting the container to the product, but also of making slight changes in the product formula so that it is compatible with the container. For example, certain pigments or dyes may give exactly the right color shade in a laboratory batch of aerosol paint, lacquer, or ink, but they may not be stable in a metal container, or they may promote rapid container corrosion. Other combinations of pigments may be more suitable. The packaging technologist working with the product formulator often can point the way to the best solution to the problem of placing the best product on the market in a container which provides optimum performance at minimum cost.

A container specification is not a static, unchanging thing. Rather, it must be changed to meet the varying demands of commercial trade and to make use of new developments in materials and container research. Container manufacturers and their collaborators are constantly searching for new ways to achieve container performance more economically. Through a continuing research program the steel companies are studying new methods of producing plate with improved fabrication quality and product resistance. Enamel suppliers each year produce hundreds of new materials and variations of present materials, any one of which is potentially an improved container material for some product.

CONTAINERS

by George Curtis and Robert F. Ellis

Technical Service Div., American Can Company, Maywood, Ill.

In addition to testing these new materials, container manufacturers devote much time to the development of new container fabrication and construction techniques so that the packager is supplied with new sizes and types of containers or other innovations, such as the stacking feature bottom, which make the package more convenient and useful. Container requirements for any aerosol product should be reviewed each year to make certain that the present container is meeting the merchandising requirements of the product and that the best, most efficient, container materials are being used.

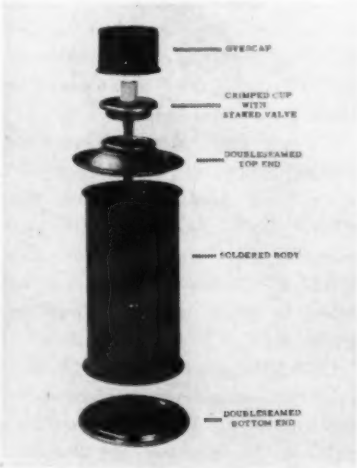
This emphasis on product and container differences may make aerosol packaging sound much more complex than it really is. Actually, for the purposes of container studies, aerosols can be divided into two general categories: those which purposely contain water, and those which contain little or no moisture.

The water based products include such items as shaving creams and shampoos. Although water is generally not considered a corrosive chemical, it can greatly accelerate tin plate deterioration under some conditions. Water based products usually require inside enameled containers to preserve product quality properly. However, much can be done to make the package more compatible with the product by varying the types of enamels used and by varying the container construction employed.

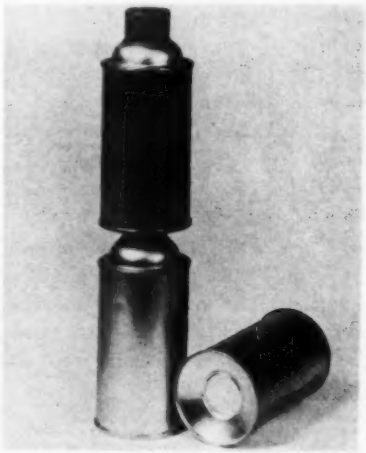
Cans for non-water bearing products generally are fabricated from plain, unenameled plate. This class of products includes insecticides, paints, some cosmetics, and many different specialty items. Most insecticides are relatively simple to package in plain cans, but with new, complex, more unstable chlorinated insecticidal compounds coming into use, enameled cans may be needed in the future to preserve product quality. Paints are another item generally stable in plain

(*Continued from page* 71)

Typical one-inch cup can.



Special stacking feature bottom.



l. to r. Early Risdon valve and container with replaceable cartridges; Risdon non-metallic valve on nylon bottle; Pharma-Craft valve on Sun Tube aluminum container; Ward-Meterspray valve on Wheaton glass lined plastic bottle; Ward-Dill valve on replaceable Wheaton bottle inside metal sheath; "Medihaler" Riker using "Emson"-Valve Corporation of America valve and special applicator on Wheaton bottle; current Risdon valve on Wheaton bottle.

About METERING VALVES

IN THE field of pressurized packaging, the term "metering valve" refers to a valve which will deliver a discrete burst of spray or measured quantity of product each time it is actuated.* Such individual bursts are sought for at least one of three reasons: to conserve the contents of small containers; to deliver fairly reproducible quantities or doses of product; or, to provide a novel package for merchandising appeal. A purse size perfume dispenser and a medicinal inhalent are typical examples of aerosol products using metering valves to an advantage.

In these and other cases where the basic problem is actually one of providing a reduced spray rate, a metering valve may be the only practical answer. This is because efforts to reduce spray rate by using exceptionally small orifices within a non-metering valve frequently lead to difficulties in fabrication, or later to clogging by minute dust particles or slight precipitates in the product.

Metering valves usually work by isolating a small quantity of liquefied propellant-product mixture in a "metering chamber" and subsequently allowing it to expand to spray independently of the charge remaining in the main container. Such isolation may be achieved by arranging two valves —one ahead and one after a measuring chamber—to function so that the intake valve shuts off before the exhaust or spray valve opens. Both valves are controlled by a single actuator or push button. This action is shown schematically in the accompanying illustration.

An early, if not the earliest, example of a metering valve for aerosols was developed by The Risdon Manufacturing Company for a purse size perfume dispenser. This was smaller than a lipstick case and featured replaceable metal cartridges filled with propellant and product. A simultaneous development, also by Risdon, featured a nylon bottle with a completely non-metallic metering valve for antiperspirants. Critical metal shortages caused curtailment of the first, and the appearance of inexpensive glass aerosols ruled out the second in favor of the current model for 20mm finish containers.

Another early metering valve, developed by the Pharma-Craft Corporation, was used to dispense their "Obay" antiperspirant. This valve utilized some of the components from standard Precision valves and was staked in impact extruded aluminum tubes.

Later, Meterspray, Inc. introduced a new type of metering valve designed by Lawrence T. Ward, who had been active in the development and mar-

*Regular, non-metering valves may have small flow regulating orifices inside which are sometimes referred to as *metering orifices;* they restrict but do not interrupt flow.

by Walter C. Beard, Jr.

The Risdon Manufacturing Co.

keting of small aerosol packages with refill cartridges for some time. The Ward-Meterspray valve was first used on purse-size aluminum bottles of about 10 to 15 ml capacity loaded with an aerosol perfume. The metering feature was incorporated in the Dill valve structure; and, the current design of the Ward valve is being sold by The Dill Manufacturing Company for use on glass bottles. In at least one application the loaded bottle is sheathed in an attractive metal case. When the bottle is empty it can be removed from the case and replaced with a refill, complete with metering valve.

The "Emson" metering valve (see pg. 36) which became available in 1955, was designed by Philip Meshberg, of American Metal Products. It is manufactured by Emson Research, Inc. and by Valve Corporation of America, under license from Emson. Made from stainless steel and aluminum, it can be supplied with different volume metering chambers and is offered for both pressure and cold filling. For use with inhalent, a special mouthpiece is used in place of a spray nozzle actuator. The "Emson" valve is also being used for dispensing perfume and topical anesthetics.

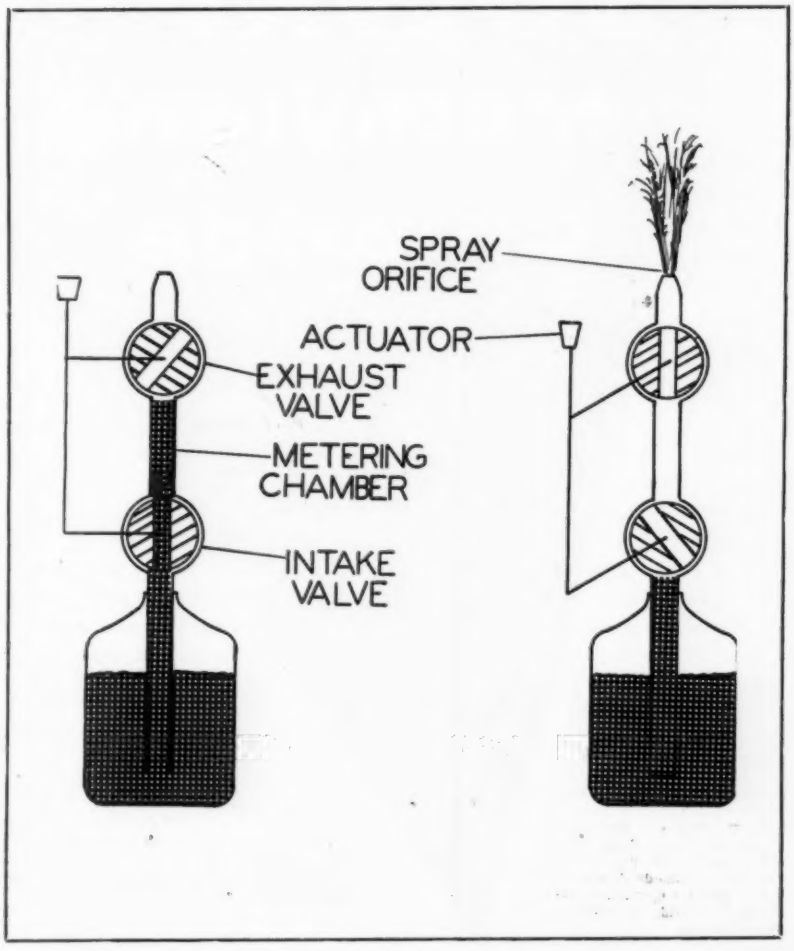
Currently available metering valves operate only with products that are soluble in the propellant and which will expand to clear themselves from the metering chamber. They do not appear to lend themselves for use with three-phase or paste packages where a positive displacement mechanism would be needed. Nevertheless, valves for these applications too can be expected if there is sufficient demand for them.

Applications for such valves might include the dispensing of measured quantities of flavors and shortening for food products; fountain syrups; doses of medicine; and, reagents or additives for laboratory and industrial uses.

When considering the quantity of product to be delivered per actuation, the formulator will probably find it more expedient to vary or adjust the concentration of active ingredients than to specify a valve with a different volume metering chamber for each product. For example, dilutions can be made to cut down dosage; and, larger, heavier dosages can be obtained by requiring a certain number of shots per application or dose.

In addition to the inherent limitations mentioned, metering valves can be expected to present the same problems posed by conventional valves. Since they are, in effect, two valves in one, they certainly should be at least double checked for compatibility and performance with the final formulation before large scale marketing.★

Cutaway view of typical metering valve showing operation.



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Position 1: valve open.

Position 2: valve closed.

Position 3: pressure filling.

More on Metering Valves

by Philip Meshberg

Emson Research, Inc., Bridgeport, Conn.

MARKET studies made in 1952-1953 by a leading cosmetic firm, revealed a major merchandising problem in the sale of metal containers for packaging cosmetic aerosols. The public, long used to buying cosmetics in a bottle, seemed to prefer to see how much product they were getting; and the waste of product resulting from an uncontrolled spray could empty a metal container much sooner than the customer expected. This could also raise a doubt in the mind of the consumer as to whether the package had originally been filled with the correct volume.

Development of a metering valve, which could control the amount of product dispensed by a single application, would give the aerosol manufacturer a means of guaranteeing the consumer a definite number of applications despite the size or type of container. Of course, the idea sounded very good but the big question was, could this be done in a practical way. After a lengthy period of trial and error, satisfactory models of a metering valve were made. The next step was to simplify the valve so that there would be a minimum number of parts, making it inexpensive to manufacture and assemble. After this was accomplished, the next problem was to try to incorporate in the valve, a means whereby it could be pressure filled. This was important since many products are packed in this manner.

At first it seemed unlikely that this could be accomplished because a metering valve is actually two valves in one. When the top valve is open to let out the measured amount of product, the bottom valve seals off the rest of the contents in the container. In order to pressure fill, it would be necessary to open both valves at the same time. If this could be done, then the next step was to make certain that after the product was on the market, there would be no way in which the consumer could accidentally open both valves, which in effect would give the same results as the regular continuous spray type valve.

This problem was solved and the pressure filling feature is incorporated in the Emson valve. This particular valve is now being manufactured from stainless steel parts for use in the cosmetic and pharmaceutical industries, by Emson Research, Inc., and Valve Corp. of America, both of Bridgeport, Conn.

It can be made from molded parts including nylon. Metering valves can be made to dispense a product from a range of 50 milligrams to 5 grams for a standard 1" opening container and for a larger amount in the standard side seam type container. Some of the other products in which a metering valve would lend definite advantages in merchandising and in effectiveness would be shaving cream, shampoo, hair lacquer anti-perspirant, personal deodorant, space deodorant, perfume, cologne, tooth paste, and of course the many possible products in the food and pharmaceutical fields.★

The Emson metering valve, shown in the photograph, was invented by Philip Meshberg (U.S. Patent 2,721,010) and is one of the successful metering types now being made for such products as colognes, pharmaceuticals, foods, etc. A special feature of this particular valve is its ability to allow pressure filling.

Fragrant Aerosols

by Leonard Stoller
Givaudan-Delawanna, Inc.

THE growth in the use of fragrant products in aerosol packages over the past five years has been really remarkable. Just how remarkable can readily be determined by referring to the figures reported in the annual aerosol census conducted by the Chemical Specialties Manufacturers Association for the period 1951 through 1954.

The 1951 survey indicated that 17,318,810 units packaged were for space and residual insecticides and moth proofers; 7,286,809 units for room deodorants and 3,649,396 units for personal products including shampoos, shaving lather, perfumes, personal deodorants, sun tan oils, hair lacquers, etc. In 1952, insecticides and moth proofers totaled 35,839,659 units, room deodorants accounted for 12,410,268 units and a new individual category for shaving lather used 16,682,378 units. Other personal products exclusive of shaving lather used 8,766,809 units. In 1953, hair lacquers alone consumed 15,120,132 units.

The 1954 report showed additional increases in the number of units expended for fragrant products. In fact, all fragrant products combined (including room deodorants) expanded to 99,876,805 units, while the insecticide and mothproofer category consumed only 43,179,070 units. Although insecticides were still the largest individual product packaged in aerosols at this point, other items were closing the gap.

The figures for 1955, when they are released, will no doubt show that toiletry aerosols have collectively taken a much greater portion of the total units produced during the year.

The decided increases in aerosol production in themselves indicate the acceptance of this medium by the American consumer. However, it might be interesting to compare the reaction of the consumer today with his buying pattern in previous years. With this in mind, let us examine the duPont consumer preference and use surveys.

In 1951, 57% of the respondents reported having purchased one or more aerosol products. This percentage increased to 87% in 1953 and 97% in 1955. 76% of those questioned reported having purchased insecticides, 59% room deodorants, 53% hair sprays, 45% shaving cream and other products in lesser degrees. The 1955 survey reported that 71% of the respondents preferred aerosol room deodorants over other packages, and 28% preferred pressure-packaged personal deodorants. Aerosol hair sprays were preferred by 68%, while 28% showed a preference for pressure shampoos over those packaged in conventional containers. Other data indicated that more and more consumers were turning from the conventional packages to the "push-button" container.

Aerosol Toiletries

The success of aerosol toiletries was anticipated by many far-sighted manufacturers who began their research when aerosol insecticides first proved highly successful. It was quite obvious, even at that time, that many toiletries could be packaged advantageously in this new medium. There were, however, many problems which had to be solved before the perfumed aerosols could reach the sales stature of aerosol insecticides. The problems were many and included emulsion stability, change in odor character, corrosion, valve clogging and leakage, incompatibility with propellants and others. It became the task of the perfumer-chemist to do the groundwork in the development of the fragrant aerosols. As far back as 1947, the first aerosol perfume laboratory was set up in New York by Givaudan-Delawanna, Inc. With the specialized equipment available in such a facility, the perfumer could work out the problems which faced him and create the fragrances necessary to help make aerosol toiletries the success they are today.

Perfuming Problems

The first task for the perfumer-chemist was to weed out those aromatic chemicals, essential oils and isolates which were not compatible with or were insoluble in other ingredients in the aerosol formulation. Such incompatibility or insolubility could be the cause of precipitation and valve clogging. Many of the commonly used fragrant materials, particularly the resins, the gums, such as gum balsam Peru, gum benzoin, some of the absolutes, and certain floral concretes, as well as some of the aromatics and isolates were found to be unsuitable for pressure package application.

Some of the perfume materials which had been used successfully in cosmetic products for many years were not adaptable in the pressure package with the aerosol propellant. It was, therefore, necessary to replace those fragrant materials which were incompatible or insoluble in aerosol formulations with others that were. In some instances, terpeneless oils and solvent extracted oils were found to be completely satisfactory in an aerosol product and adequately replaced their insoluble counterparts.

The perfumer was also faced with the problem of odor change when a product was pressure dispensed. The dissemination of the product in minute particles immediately after it is forced through the aerosol orifice has a decided effect on the scent of the entire composition. This, and other factors, necessitated the complete reformulation of many products before they could be packaged successfully in aerosol containers. And, this reformulation had to be done carefully to avoid the use of ingredients which might, in themselves, be incompatible or insoluble in an aerosol product.

Early experimentation also indicated that materials not irritating in ordinary use could cause some stinging and burning of the nasal passages when aerosol dispensed. These materials, once identified by the perfumer, had to be avoided in aerosol compositions.

When creating an aerosol fragrance, the perfumer has to keep in mind the particular requirements of the individual product involved. It may be necessary, as in the case of some conventionally packaged products, to mask an inherent odor of basic raw materials. This becomes even more difficult in an aerosol material, since the masking agent must be able not only to cover the odor of the basic materials while standing, but also once the product has been sprayed. In addition, the masking agent must be completely soluble in and compatible with the other aerosol components.

After the development of the fragrant aerosol, a comprehensive shelf test is absolutely necessary. Such a test, over a definite period of time, will normally reveal to the perfumer whether or not any deteriorating changes have taken place in the container. If the product remains stable throughout the test, it can be reasonably assumed that it will remain so under normal marketing conditions.

Over the last few years, many of the problems facing the perfumer have been solved. As aerosol containers were further developed and changed, most of the new problems that arose were also satisfactorily dealt with. The glass aerosol, found to be highly suitable for many toiletries, eliminated some of the problems previously encountered with metal containers, such as corrosion, but created some new ones. Today, however, the perfumer is in a position to recommend fragrances compatible with any type of aerosol product or to custom-make one for a specific end product. He is ready to turn his thoughts to the further advancement of pressurized packaging such as the use of aerosols for powder products which will soon be a reality.

What May Come

Today, there are more products packaged as aerosols than many people would have thought possible ten years ago. In addition to the materials we have already mentioned, the following are now offered to the consumer: aerosol packaged air fresheners, antiperspirants, perfumes and colognes, hand lotions, athlete's foot preventives, bactericides, burn ointments, fire extinguishers, waxes and polishes, hosiery protectants, paints, topical anesthetics and many more too numerous to be listed here. And, many new products are in the process of development.

No doubt such products as leg make up, depilatories, hand and night creams, and many other toiletries will soon be added to the already impressive list. Liquid dishwashing detergents, starches and dentifrices will also be aerosol packaged in the not too distant future. The food industry has opened a new avenue of development for the pressure package, and many items now packaged in glass and other containers may soon be seen as aerosols. We must also not forget the great potential in pharmaceuticals where many materials will undoubtedly soon be packaged in

(*Turn to page 69*)

The amount of fragrant materials, perfumes, odor masking chemicals, etc. used in aerosols looks to be small in comparison with the total weight of metal used for containers, with the total volume of propellant used, and with the great amounts of actual product used to fill the unit; however, the importance of these fragrant materials is much greater than the actual volume used indicates, and the cost relatively high.

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Suggestions on AEROSOL LABELING

With a relatively new line of products such as aerosols, labeling is of particular importance. The buyer who fails to use a product correctly through lack of correct and adequate instructions is not liable to be a repeat purchaser. The marketer should of course attempt to supply on his package complete, detailed and thoroughly adequate instructions so that, in as far as possible there will be no reason for dissatisfaction with the product in use.

A number of the precautions to be borne in mind in writing a label for an aerosol package are detailed in the latest issue of *European Aerosol Survey*, newsletter published by Druk Pak, Ltd., Zurich, Switzerland. While the suggestions are intended primarily for the European market, where aerosols are still in many respects far behind the United States, there are still a number of suggestions on labeling which it would well pay American packagers to heed.

The label for an aerosol product must not merely be an eye catching selling point of color and design (although this is important) but must also contain instructions covering the following points:

1) Instructions for use and application
2) Objects to which product is to be applied
3) Safety hints in connection with use
4) Care of container
5) Statement of product ingredients

Obviously the label must be built around the kind of container (drawn steel or aluminum; tin-plate, electrically welded; black-plate; tin-plate, soldered and seamed; or glass bottle). On a drawn steel or aluminum container, for example, where the shoulder can take the same background color as the seamless body, a lithographed label is a logical choice if the run is sufficiently long to bring the cost down. On any sizeable volume, lithographing on metal is even cheaper than a paper label.

On electrically welded or seamed or welded tin-plate cans the body seam presents a problem. Lithographing on such containers leaves the unsightly seam, which the paper label will cover. With the black-plate can, a paper label is the only answer.

The recommended technique with the smaller glass bottle is to string-attach a little booklet. It is not safe to rely on printing the label text on the card-board package for this is customarily thrown away.

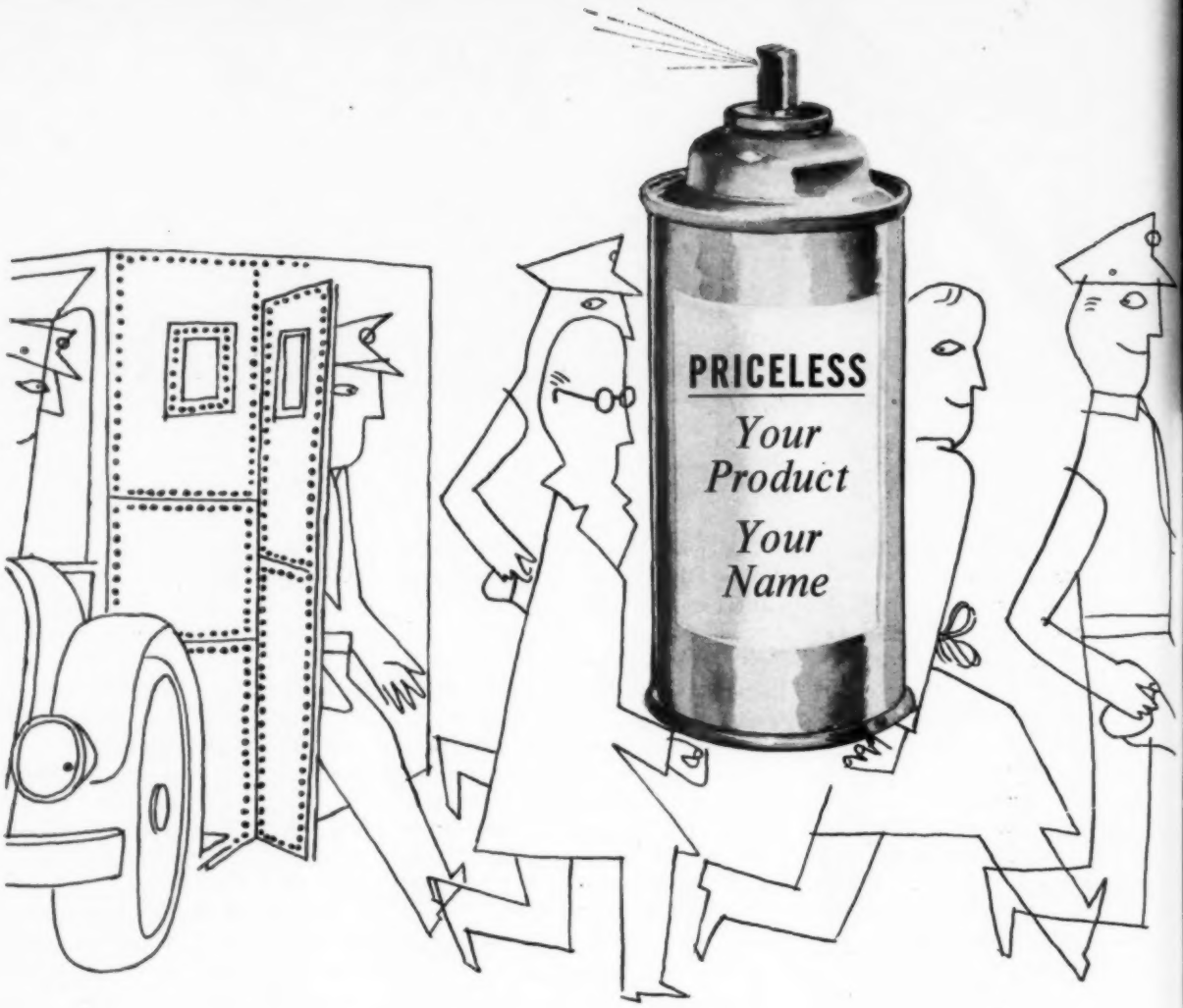
Instructions for use obviously depend on the kind of product, i.e. whether a space spray, surface spray, foam, etc. With the true aerosol space sprays (insecticides, air-fresheners, etc.) the user should be instructed to direct only a few blasts of from 4 to 5 second into the upper corners of the average size room. He should be cautioned to close doors and windows and not open them for 10 to 15 minutes after spraying for effective results.

In surface sprays (lacquers, paints, hair sprays, residual insecticides, etc.), which incorporate a lower proportion of propellant and thus give a wetter spray, directions should be specific as to how far to hold the container from the surface being sprayed. For example: "Hold container from . . . distance to . . . distance from surface to be sprayed until a wet surface has been achieved. Apply at the rate of about . . . seconds for each . . . area to be sprayed."

The user should be instructed to move the spray cone across the area (horizontally or vertically) at a suggested speed. The exact directions on this point will depend on the product, type of valve and discharge rate. Adequate and specific instructions are important here, for in marketing a new product to a new customer, satisfaction and repeat purchases obviously are going to depend upon how efficiently the customer uses the material. He must be instructed in how to use it correctly.

With all foam sprays (shaving soaps, shampoos, sun-tan, fluff, etc.) which have a low propellant charge and contain quite a bit of water, a problem is created because the active material will settle to the bottom of the container when it is not in use. Therefore, the most prominent label instruction must emphasize: "Shake thoroughly before each use." This is extremely important with foam products, for the propellant has to be thoroughly diffused through the prod-

(*Turn to page* 70)



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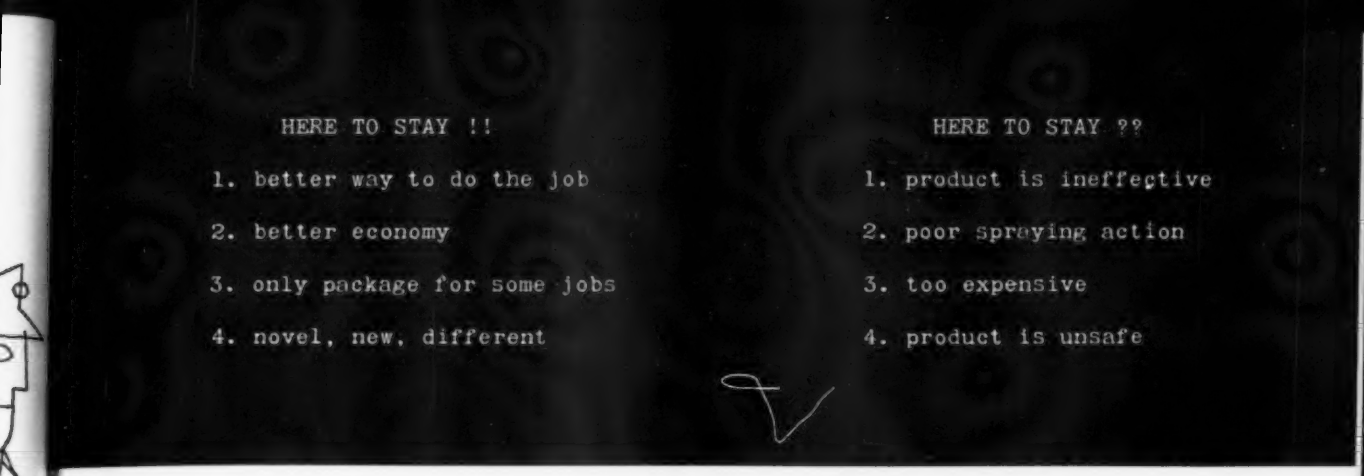
HERE TO STAY !!
1. better way to do the job
2. better economy
3. only package for some jobs
4. novel, new, different
HERE TO STAY ??
1. product is ineffective
2. poor spraying action
3. too expensive
4. product is unsafe

Aerosols Are Here to Stay!(?)

Two sides of the aerosol "coin" were shown to the Chicago chapter of the Society of Cosmetic Chemists recently: "Aerosols are Here to Stay!" and "Aerosols are Here to Stay?"

Citing the following factors, Eugene L. Rose, president of Gene Rose Co., Chicago, enumerated for members a number of the reasons why pressure containers have had a tremendous expansion in use over the past 5-10 years:

a) Aerosols offer "a better way to do the job."
b) Better economy and more mileage per can are realized.
c) Products that never could be packaged any other way can be marketed successfully as aerosols.
d) They are "novel" — something new, different.

Statistics presented by Mr. Rose included the impressive jump in number of units produced in the U. S., from 5 million to 250 million units since 1947. The consumer purchase rate, which averages 50 per cent on most aerosol items, was broken down into the following categories: insect repellants (65-70 per cent); room deodorants (55-60 per cent); hair spray (50-55 per cent); and shaving cream (25-30 per cent). Growth of the aerosol division of the Chemical Specialties Manufacturers Association was cited as an impressive indication of the soundness and stable growth of the aerosol industry; also, the investment in time and money for research, educational films, publicity programs, etc. of many suppliers and aerosol fillers in the field is indicative of the industry's value, the speaker declared.

Commenting on this bright picture of the aerosol market, Mr. Rose said that aerosols have given us a way of life much more enjoyable; people being "basically lazy" and always welcoming easier and better ways of doing things whether it is household chores, personal beautification or performing the many necessary duties of life. Also, people are always intrigued with something *new* and *different*, elements that aerosol products clearly possess.

Sounding a note of caution along with his more optimistic observations, however, the speaker reminded that surveys have indicated that approximately 16 per cent of the people buying aerosol products are dissatisfied with them — thus the "Here to Stay" tag on the industry might become "Here to Stay???"

Reasons for dissatisfaction were listed as follows:

a) The products are not always effective. In 1953, this reason accounted for 31 per cent of complaints — in 1955 it had risen to 51 per cent.
b) Container clogs or has poor spraying action. Apparently much progress has been made along this line, however, as this reason accounted for only 11 per cent of complaints in 1955 as compared with 32 per cent in 1953.
c) Too expensive. More people are unhappy about high cost than there were in 1953. The per cent of complaints on this point rose from 10 per cent of total in 1953 to 21 per cent in 1955. Improper screening of products is responsible.
d) Product considered to be unsafe. This reason accounted for 6 per cent of all complaints in 1953 and the same in 1955.

Taking a long look at this review of complaints, the speaker suggested that the challenge presented to the aerosol industry is a challenge to cultivate an old friend—*Quality*.

Responsibility should be defined, Mr. Rose declared, and the adoption of a code of ethics by the industry would seem to be a logical step in his opinion. Elimination of excessive claims, inferior substitutes and misleading packaging are goals to be attained. Comparison of the aerosol industry with the plastics industry some years ago was made, when materials used in the fabrication of many plastic products were not engineered to the final use. Mr. Rose asked Society members to accept the challenge presented by aerosols and to assume the responsibility for quality aerosol cosmetic products.★

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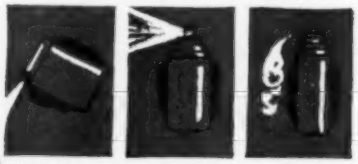

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Pressure Packing Overseas

In this installment of his monthly column Dr. Tom C. Clark of Druk-Pak, Zurich, Switzerland, reviews the Italian aerosol industry which, he indicates, is far ahead of the balance of the continent. The most interesting development in the Italian industry, he reports, is the one piece aluminum container . . . which he says may well be the aerosol can of the future.

WITH over 12 filling stations in operation, the Italian aerosol industry leads all other European countries. 1955 production has been estimated at 6 million cans, but it may well have exceeded that figure. With a population of only about 47 million, this represents an annual per capita consumption of one can for each 8 people — fairly large for a new industry where the purchasing power of the buyers is low. Consequently, prices have to be kept down and they have been. Also, there have been many interesting developments, — particularly in containers.

The range of aerosol-packaged products is limited, but growing, being principally confined to insecticides of which there are many varieties on the market. For the 10 and 12 ounce size, there is a practically uniform price of 550 Lire ($0.85). Geigy, Milan, also has a 6 ounce uncoated glass bottle which, with a screwed-on Galeazzi valve, stands about 7 inches high. This low pressure aerosol, on the market a couple years, has proved most satisfactory at a price of 480 Lire ($0.67). Even with all their marble and stone floors, the Italians seems to have no fears about using it. The quality of their insecticides is good and they label the contents, mostly based on DDT.

In room deodorizers, we liked an "Aersana" (Roberts of Florence) in 8 ounces at 850 Lire ($1.38). "Air-Fresh," with its standard concentrate is also represented in a 6 ounce can at 690 Lire ($1.10).

The cosmetic line is just starting, and here again we have the uncoated glass bottle with the screwed-on valve which most women want to operate by turning instead of pressing — one turn and the pressure goes. The Pinaud people have their Quinine hair tonic in aerosols and there are many kinds of toilet waters and eau de colognes. With typical Latin ingenuity, Italian packagers have gotten around the plastic coated bottle by providing an attractive reusable anodized aluminum container, with cover, into which the bottle is fitted. The top of this container, through which the valve is activated, is removable, permitting its reuse when the bottle is empty. The containers come in different sizes for different products and M'Lady can have a complete garniture on her dressing table. The containers we saw were gold anodized with black printing and black anodized with gold printing — very attractive — price 1,800 Lire ($2.88), for a 3 ounce bottle of pleasant toilet water.

One reason for the reasonable prices is domestic manufacture of all required kinds of the fluorinated hydrocarbon propellants by Montecatini in Milan which also has its own line of insecticides under the name "Timor." The propellants are more reasonable in price than in the other Western European countries, due principally, it is reported, to a raid made last year on the Italian market (for some unknown reason) by ICI, the British producer. But things have now settled down to the benefit, mostly, of the consuming public, a rare result in European price wars.

So far as we could determine, there are as yet no pressure filling stations in Italy, and no domestically produced foam products are on the market. U.S. imported aerosol shaving soaps, 6 ounce, sell for $1.25 to $1.50. We understand some pressure filling stations will open this year and at such prices the market should be good.

In valves, Italy has a lead over other European countries. The leading can producer, Bombrini Parodi-Delfino (B.P.D.) in Rome and Milan, is the Precision licensee and has a dominant position in the market with a price of 35 Lire (just under 6 cents). The Galeazzi (Vapsol) valve is an Italian development and has found some favor in France, Switzerland, UK and Germany. Mr. Galeazzi did much to pioneer the Italian development in aerosols and his firm in Milan also makes a line of filling equipment.

By far, however, the most interesting development in Italy is the one-piece aluminum aerosol can. Steel is expensive in Italy and their tinplate production does not cover domestic requirements. The first aerosol cans to appear some years ago

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were two-piece aluminum cans, some of them with a tin-plate bottom for magnetic attraction in the test-bath. The body of the can was made of one piece aluminum, extruded cold from a slug in a Herlan press of German manufacture. Now they have developed a process for turning down the top of the one-piece can to fit the standard one inch mounting cup and concaving the bottom to stand the pressure. The 12 ounce size, with inner lacquer and painted outside one coat, costs about 7 cents, in substantial quantities less. All sizes are available from 4 ounces up.

The can is made from the conventional aluminum slug and cold extruded in horizontal presses, mostly of German manufacture. But it is the slug making process which has permitted the Italians to get their can prices down. Their ingot aluminum is more expensive than in the U.S. and only export draw-backs permit its shipment outside the country. It is reported they can produce their slugs at a conversion cost of from 6 to 7 cents U.S. per pound over the cost of ingot aluminum. Consequently, they get a slug cost of from 30 to 32 cents U.S. per pound. In the United States we understand comparable slugs cost around 50 cents per pound.

To make their slugs they start from molten ingot aluminum which they cast into strip on a revolving water wheel about 3½ feet in diameter. Jets of cold water are sprayed on both sides as it turns. In one half turn, the solidified strip is taken off the bottom and coiled. U.S. engineers who will not believe this feat, are invited to come over and see it for themselves. Inspection free — license fee nominal.

After the strip has cooled, it is given a couple of quick passes through some light two-high rolls and then the slugs are stamped out. The scrap goes back in the cupola. After the slugs have been annealed, they are given a lubricating coat of wool-fat in a tumbling machine and are then ready for the presses. Other Italian companies have other methods of forming the slugs, but mostly they start from a strip (maximum width 4 inches) cast from molten aluminum on a water-wheel.

Bombrini Parodi-Delfino near Rome, is probably the largest can manufacturer, but is being crowded by Tubettificio Ligure, Abbadia Lariana (near Lecco, on Lake Como). We visited this plant recently and can report that it is the most modern and complete aluminum can and tube manufacturing plant on the Continent and perhaps in the world. Here a battery of 8 Herlan presses can turn out over 400 cans and tubes per minute. After the body is formed in one operation, to make the one-piece aerosol can, it is put in a horizontal drawing machine where it revolves through 16 different dies to draw down the top and concave the bottom. After this, there are three separate operations on the top to trim, sink and form the rim for the mounting cup. There is no necessity to pressure test these cans, for there are no seams.

The mounting cups on most of the valves are also cold extruded from aluminum slugs, eliminating any electrolysis between two metals; but the

(*Continued on page* 73)

European Market To Double in 1956

With orders to contract fillers in the first three months of 1956 exceeding the volume for all of 1955, total production of aerosols in Europe seems sure to at least double the units produced last year. An estimate of production by countries is shown in the accompanying table.

European manufacturers are following the U.S. pattern closely as to the kind of products being marketed. Surveys made in England, Germany and Italy reveal the following:

INSECTICIDES: In each of the three countries, there are about 8-10 fillers loading one or more products, mostly DDT, Hexachlor, Lindane, and Pyrethrum, amounts of each depending on national preference. Only a few special insecticides for specific agricultural tasks have appeared as aerosols. In Italy, good success has been had with insecticidal sprays for vineyards and orchards.

AIR-FRESHENERS: In the respective countries, products of 6-8 fillers are on the market; also, U.S. products are being loaded under license.

FIRE-EXTINGUISHERS: One producer in Switzerland and two in Germany are loading the effective "CB" surface or liquid fire-extinguishing agent of Farbwerke Hoechst, said to be especially effective on carburetor and mineral oil fires.

HAIR PRODUCTS: About 8 nationally distributed hair-sets are supplemented by local fillers in all three countries.

PERFUMES: A rapid growth is envisioned in colognes, deodorants space and residual perfumes, hair and

(*Continued on page* 71)

COUNTRY	ESTIMATED 1955 PRODUCTION (UNITS)
Austria	50,000 — 60,000
Belgium	500,000 — 600,000
Denmark	200,000 — 250,000
England	5,500,000 — 6,000,000
France	2,500,000 — 3,500,000
Finland	100,000 — 150,000
Germany	4,500,000 — 5,000,000
Holland	200,000 — 250,000
Italy	5,500,000 — 6,000,000
Portugal	50,000 — 60,000
Sweden	200,000 — 250,000
Switzerland	500,000 — 600,000
	19,800,000 — 22,720,000

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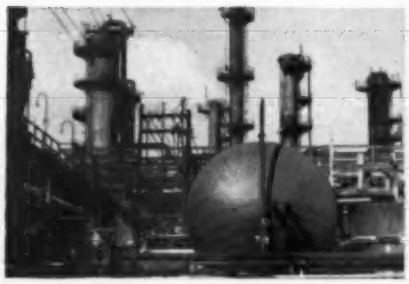

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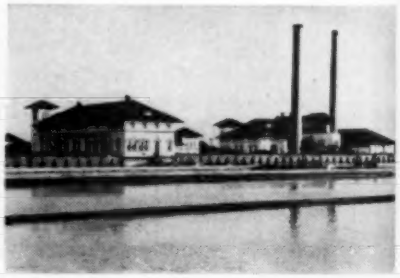

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Pennsalt Chemicals

Aerosols . . . . in Spotlight

AEROSOLS are now competing with and steadily gaining on older forms of packaging in the toilet goods industry, and even powdered products are now being prepared in pressurized containers. This was the statement of Victor DiGiacomo, technical director of Givaudan-Delawanna, Inc. at the Toilet Goods Association's annual convention, May 15-17, at the Waldorf-Astoria Hotel, New York.

In his paper "Problems in Dispensing Powders from Pressurized Containers," presented to the Scientific Section, May 17, Mr. DiGiacomo briefly reviewed the history of the first powder or solid products packaged as aerosols, paint sprays. The products, contained a heavy concentration of pigment with solvent, dryers and other carriers, all necessary to obtain good coverage. A metal or glass ball was placed in the container to break up sedimentation, a condition that frequently was encountered after a period of standing on the shelf.

The problems faced by manufacturers of paint aerosols are about the same type confronting those interested in aerosol packaging of powder toiletries, pet sprays, botanicals, and pharmaceuticals, Mr. D.Giacomo observed. Many of the solvents and carriers used in paint sprays were fast drying — and if the pigment did not clog the orifice, the solvent and carrier could work to a disadvantage. It was absolutely necessary to use solids of a definite particle size to make sure that the valve seated correctly, to get satisfactory valve cut-off, and to prevent clogging.

One of the newer powder aerosols, a fire extinguisher containing sodium bicarbonate, has a valve in which the seat is punctured and free flow is insured—no shut off. A metal or glass ball is used. No intricate mechanism is needed here.

Advantages of aerosol containers over conventional packages for powder were listed as follows:

1) Dispensing powder under pressure gives mix uniformity and prevents oxidation—doesn't allow contact of chemicals with air.
2) Products which are normally hydroscopic lose this characteristic when aerosol packaged. Thus decomposition is reduced.
3) "Sterile" cosmetics can be formulated and dispensed.

Reformulation is necessary with most powdered products since they are, in general, incompatible with propellants now on the market. The speaker observed that products can be formulated successfully using 10-30 per cent powder. Propellant mix may vary—65 per cent of propellant 11 and 35 per cent propellant 12 seem suitable for most formulations having 20 per cent solids.

Mr. Di Giacomo said that wetting agents have been used in experimental work for dispersion; however his system uses a suspending medium which prevents agglomeration and sedimentation through ability to absorb propellant in addition to being able to suspend powder. The speaker recommended a pure grade of isopropyl myristate as an ideal suspending agent for powder aerosols. An additional advantage of this agent was said to be its ability to prevent crystallization of other components of the formulation.

Victor DiGiacomo

Ten characteristics of a good suspending material, suggested as being essential for powder aerosol formulation, are that it must be:

a) soluble in various propellant mixes
b) odorless or of low odor level
c) compatible with and soluble in essential oils, aromatics, isolates, and other fragrant materials
d) greaseless
e) non-irritating
f) usable in low concentrations
g) capable of suspending powder formulations
h) readily dispersed on shaking, without use of mechanical device
i) must not attack valve or other parts of container
j) preferably soluble in hydrocarbons

The pure grade of isopropyl myristate, as previously mentioned, possesses these properties and also, when used in higher than normal concentrations, gives a higher residual value to end products such as leg make-up, plant sprays and others.

Other speakers and their topics on the Scientific Section Program included:

Axillary Perspiration — Odors and Deodorization, by W. G. Fredell and R. R. Read, Lambert-Hudnut Div. of Warner-Lambert Pharmaceutical Co. Inc.

The Sphere of Research by Paul G. Lauffer, The George W. Luft Co. Inc.

The Physicochemical Characterization of Essential Oil Constituents and Their Derivatives by Modern Instrumentation Techniques by Leo Levi and James L. Thomson, Food and Drug Laboratories, Dept. of National Health and Welfare, Ottawa, Canada and James C. Evans and Harold Bernstein, Pure Chemistry Division, National Research Council, Ottawa, Canada.

Shampoos — A Practical Method of Evaluation by W. G. Fredell and R. R. Read, Lambert-Hudnut Div. of Warner-Lambert Pharmaceutical Co. Inc.

as

TGA CSMA Cos-Chemists Meet

CHEMICAL Specialties Manufacturers Association meeting in Chicago, May 20-22, will include a panel discussion on "Forecasting in the Aerosol Business," in the three day program. T. D. Johnson, Jr., manager, aerosol propellant sales, E. I. duPont de Nemours & Co., Inc., "Kinetic" Chemicals Division will be moderator. Members of the panel and their fields of interest are: Valves—A representative of Precision Valve Corp., Yonkers, N. Y.; Fillers—George Barr, G. Barr & Co., Chicago; Cans—Harvey Tull, Crown Can Division, Crown Cork & Seal Co., Philadelphia; Marketing—Harry Dean Wolfe, Colgate-Palmolive Co., New York; and Audit & Survey in the Aerosol Division and Future Outlook—Robert Williams, Audits & Survey Co., New York.

The annual report of the Aerosol Division will be given by Charles E. Beach, John C. Stalfort & Sons, Baltimore, and chairman of the division, on Monday morning.

Some last minute changes in schedule of papers to be presented were: movement of Winston H. Reed's talk, "Propellant A—A New Propellant Blend" from Tuesday afternoon to Monday morning immediately following the report of the nominating committee; and rearrangement of the Panel Discussion, so that it will follow the abovementioned paper by Dr. Reed.

Papers to be presented Tuesday afternoon, H. C. Mackintosh, presiding, are as follows:

"Non-Flammable Paint Strippers, Part 3—Activators, Thickeners and Evaporation Retarders," by Bernard Berkeley and Daniel Schoenholz, Product Development Dep't., Foster D. Snell, Inc., and Michael Skrypa, Product Development Dep't., Solvay Process Div., Allied Chemical & Dye Corp.

"The Application of the Interstate Commerce Commission Regulations to the Shipment of Aerosols and the Enforcement of the Regulations" by H. A. Campbell, chief inspector, Bureau of Explosives, Association of American Railroads, New York.

"The Automatic Measurement of Aerosol Particles," by Sidney Katz, senior chemist, Armour Research Foundation, Chicago.

"Perfume Oils, Stability, Etc. in Aerosols" by Herbert G. Kainik, Dodge & Olcott, Inc., New York.

Committee meetings of the Aerosol Division are scheduled from 9 a.m. through 7 p.m. on Sunday, May 20. The administrative committee, Charles E. Beach, chairman, will meet at 4 p.m. Other committees planning sessions include:

9:00 A.M.—Project Committee on Pressure Determination for Glass Containers—*Montfort A. Johnsen*, chairman

9:00 A.M.—Safe Fill Sub-Committee, *J. J. Buchanan*, chairman

10:00 A.M.—Methods for Determining Particle Size Sub-Committee, *F. W. Blodgett*, chairman

10:00 A.M.—Paint Products Methods Sub-Committee, *D. S. Tillotson*, chairman

10:00 A.M.—Project Committee on Glass Bottle Pretesting, *John H. Beacher*, chairman

11:00 A.M.—Project Committee on Glass Bottle Drop Testing, *Joseph S. Lann*, chairman

11:00 A.M.—Personal Products Standard Methods Sub-Committee, *Gene Rose*, chairman

(*Turn to page* 69)

Formulation Of Aerosol Hair Sprays

THE phenomenal growth of hair spray in the last five years and its adoption by the consumer as a cosmetic staple as far as hair products are concerned has focused a considerable amount of attention on this product by cosmetic chemists. Speaking to members of the Society of Cosmetic Chemists at their annual meeting, Biltmore Hotel, New York, May 18, H. R. Shepherd, president, Aerosol Techniques, Bridgeport, Conn., said that the various problems attendant to the formulation of any cosmetic product are present when working on hair sprays; but superimposed on these problems are the peculiarities of the aerosol principle.

Proper selection of a combination of seven possible components is essential, he continued: film forming constituents, plasticizers, hair conditioners, humidity modifiers, emulsifiers for water insoluble films, perfume, and propellant, all properly formulated and compatible with the container and valve.

Also discussed in Mr. Shepherd's paper, "Some Practical Problems in the Formulation of Hair Sprays" were commercial problems in manufacturing processes and laboratory screening techniques for evaluation of hair spray films.

H. R. Shepherd

Selling punch for your insecticides...

FAST KNOCK-DOWN AT LOW COST WITH

LETHANE 384

Customers judge your insecticides by their knock-down speed and effectiveness. LETHANE 384 *assures* maximum knock-down efficiency. And today it is still the fastest knock-down ingredient per unit of cost.

Consider its use in:

HOUSEHOLD LIQUID SPRAYS—Low, economical concentrations of LETHANE 384 in household sprays complement the insecticidal power of chlorinated compounds with fast knock-down.

AEROSOL PRODUCTS—LETHANE 384 is compatible with all ingredients approved for use in household insecticide aerosols. A concentration of only 2% helps to give high knock-down—at unusually low cost.

CATTLE AND DAIRY LIQUID SPRAYS—When LETHANE 384 is used alone, or with a suitable chlorinated insecticide, it gives fast-acting, high-kill products for use on livestock, and in dairy barns and milk rooms.

LETHANE is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

"What's the Problem?

Q. Are results obtained in laboratory accelerated tests adequate to assure normal shelf life of aerosol products?

A. In most cases accelerated laboratory tests have proved satisfactory, so it is relatively safe for the packager to take what may be called a calculated risk in going ahead with a product which has shown up well in such tests. A very important factor, of course, is to be sure that sufficient compatibility data is available on the container to be used. However, even when the accelerated tests give an affirmative answer, actual shelf life tests are always advisable. Only when their evidence supports the findings of the accelerated tests can we proceed with a real feeling of confidence. The usual period for shelf tests is six months. If the product remains stable for this length of time, there is more than a reasonable assurance that it will be proof against deterioration over a longer period.

Q. Is the aerosol insecticide market too closed and competitive for newcomers to enter the field?

A. This type of thinking leaves the door wide open for the smart merchandising company to move in and take over. On the basis of sales figures alone, any one interested can see that 33 percent of the people who buy insecticide have *not yet* purchased an aerosol. Thus, a third of the insecticide market is still open to aerosol use.

If such a high percentage of insecticide buyers have not yet purchased aerosol insecticides, the big question is why not. Progress was made between 1954 and 1955, about a 20 percent improvement. From here on, further progress will, of course, get harder unless a different kind of merchandising or product enters the field. Basically, all insecticides have an unpleasant odor and while some will say that this sells the product because this smell is expected, the housewife is getting tired of the odor and is definitely looking for a product more pleasant to use. Perhaps part of the answer might lie in a residual powder spray to be used around baseboards. A few brainstorming sessions could help to open up this field.

Q. Where does one go to get a research study of a product for aerosol?

A. It is assumed from the nature of the question that this company does not now have any aerosol products and is not working with any filler; so we will try to point out the various paths for research. If the product is one which has been marketed in another form, you may save yourself considerable time and money by referring the problem to any filler or loader. It is quite possible that they, through their research facilities, can answer your questions and run the necessary tests to evaluate your product.

If, however, you hesitate to reveal your product or ideas to anyone in the industry, you can readily locate a testing laboratory that has done aerosol research. The propellant, valve and container manufacturers can also be very helpful.

There should be no concern necessary, however, about talking to fillers in the aerosol industry in confidence. Their future and very existence are dependent on customer faith and good will, and they will not violate your confidence. Select the one you consider to be best equipped to handle your particular problem and tell him the complete story. Give him samples and leave the problem with him. He will come back to you with a full report in understandable form, probably with samples filled for your further testing. Some of the most successful products on the market today are successful because some filler spent the necessary time and money in the laboratory proving them out.

Harold Lee, eastern sales manager of Continental Filling Corp., will author a Question and Answer Column each month for Aerosol Age.

Questions to Mr. Lee should be addressed to Harold Lee, c/o AEROSOL AGE, P.O. Box 31, Caldwell, N. J.

Q. What is the biggest drawback to using aerosols on animals?

A. This is a big question. To cover it fully would take many pages; however, let us assume that the formulations are completely correct and will not cause more trouble than the illness or problem with which you are dealing. The two remaining problems as we see them are noise and temperature. In all of the experiments we have seen, the animal has been extremely frightened by the sudden noise created by the aerosol used. This can be overcome to some extent by varying valves and formulations.

The second problem falls right in with the first. In treating the animal, unless you have it well under control,

the relative coldness of the product causes distress and fear. Unless the treatment is virtually instantaneous, control becomes a problem. Some success has come through reformulating and valve changes, but there is still much work to be done. Since such treatments by aerosols seem to have much to recommend them, progress will undoubtedly follow and these problems will be solved.

Q. What about new products for the commercial field? Are there any suggestions in this direction?

A. I have one which has my special attention at this time, a diaper can deodorant. The other day for the first time it became my duty to prepare the take aways — peeyu! Here is a wide open field for the industry and added sales for the laundries. Let's get to work. Specialized products for special uses are in demand.

All of us are plagued by drawers that stick, windows that don't open. We are always going to do something about it, but never quite get to it. Why not let the women do it with an aerosol?

Incidentally, a long time ago someone suggested a can of straight propellant for home work-shops to use, much the same as compressed air is used in the machine shop. Another idea on the merchandising side is to make a combination pack like soda pop and sell three to six products at a time as a special. Of course, the problem here is high unit sale price, but it might be worth a try. Ed Hay of General Aniline has about 'steen new uses for PVP and the makings of several new and useful products some of which will surely fall into the commercial category.

Q. We ship most of our products overseas to the near east and far east where temperatures in warehouses are often as high as 140°F., and are concerned whether the cans will stand this temperature.

A. Standard aerosol low pressure cans conform to ICC Standards and aerosol fillers conform to standard procedures for testing both can and filled package. Your problem is not so much concerned with whether the cans will stand the pressure created by high temperature as it is with obtaining the proper formulation, especially on the propellant side, to give you leeway for this high temperature. Take this matter up directly with your filler or the propellant supplier. They can formulate around this problem without difficulty.

Merchandising Corner

A NEW 12-ounce commercial size of Leprechaun Mist Suede Restorer which will retail for $2.50 is being introduced and field tested in several major women's fashion stores and in I. Miller's group of shoe salons by Leprechaun, Inc., New York. The product is said to contain ingredients which are used in the actual processing of suede. It is colorless, nontoxic and has no cleaning fluid odor. It may be used on all shades of suede except white, to restore lustre to soiled or damaged articles.

Leprechaun suede restorer, claimed to be the original product in the field, was first tested at Lord & Taylor's, New York, in 1951. Only one size was then offered, retailing at $1.75. After a 90 day test period, several months elapsed in which a careful check was made for repeat purchases. Following satisfactory customer reaction, the I. Miller stores in New York, Philadelphia, Washington, Hartford, Baltimore, Brooklyn, Atlantic City, and White Plains, N. Y. took the product.

First advertising copy was placed in San Francisco in 1951 and specialty stores stocked the item in handbag, cosmetic and shoe departments. Subsequently Leprechaun took a warehouse and now maintains offices in San Francisco.

Promotion of the new commercial size (can by Continental) will include sponsoring local TV spot shows and trade, newspaper and magazine advertising. Best and Co., New York, are testing the commercial product now. The shoe repair department of Gimbels, Inc., New York, are using the product themselves to salvage faded, scuffed or damaged stock and are also selling the smaller 4 oz. retail size which sells for $1.

The company uses a sales inducement program to help boost sales. The store handling the product receives a "Crock of Gold" certificate and the store manager fills in the names of his clerks participating in the program. A bonus of 15 cents a container is given to each sales-person during the promotion period plus 10 cents per container advertising allowance.

The $1 retail size is packed in dozens with a counter display for impulse selling.

Consultant's Corner

By Robert A. Foresman, Jr.

Odor Of Insecticides:

EVEN though a little late for comments that rightly belong to the planning period for summer aerosols, here are a few items which may still be pertinent.

Special Consideration Necessary

The major insecticide suppliers have done such a comprehensive job that generally I have advised my clients against using my services for insecticide formulation. Instead, I have recommended that they simply buy concentrates, already made up and USDA approved, from any reputable supplier.

These stock insecticides have all done their primary job, of course, but for some time I have had a quarrel with the background stench of most of them. Insecticides relatively free of malodors are possible and in the course of the last three years I have been concerned with several that were made up without the alkylated napthalene solvent. The result was that the characteristic odor of aerosol insecticides is practically non-existent.

The effectiveness of the general run of household-type insecticide is measured by the consumer according to the speed with which insects are knocked down or immobilized. The ingredient which accomplishes this is of course the pyrethrin or pyrethrin-like fraction of the formula. These materials with their synergists are soluble in deodorized kerosene and can be packed in the usual 80/20 or 85/15 proportions as aerosols without the presence of strong solvents.

Where additional killing power is desired to make doubly certain that all insects knocked down will stay down, or for residual effect, DDT or methoxychlor is added to the formula. These materials require greater solvent action than the pyrethins, with the result that alkylated naphthalenes, rather than kerosenes, must be used as a carrier base. This is the source of the major part of the malodor.

For most household use, the effectiveness added by DDT or methoxychlor is marginal and could probably be ignored. If, however, it is desired to use either one, methylene chloride is a good solvent and will make possible formulations free of the alkylated naphthalene odor. If such a formula is contemplated, a thorough test program using all final package components should be completed to make sure that the methylene chloride will not cause trouble.

If a relatively non-odorous insecticide formula is used, it will be possible to combine air deodorant type perfume oils in the formula to achieve a clean or refreshing odor. There are some who feel this is the wrong approach to the problem, but acceptance by the public where it has been tried has been enthusiastic. Life would certainly be more pleasant where insecticides must be used if this approach becomes more general.

I do not necessarily advocate that each aerosol filler make up his own concentrate, but pressure on the major suppliers for more of the pleasant smelling products could result in a worthwhile overall improvement. (Note: Most of the suppliers have a few formulas in this category at the present time). Insecticides are still a major out-put of the aerosol industry and therefore highly competitive. For those interested, I would suggest they give this approach a trial. I doubt that they will be disappointed.

Summertime Personal Products:

During the past two summers there has been an appreciable growth of personal product aerosols which are either intended for beach use or which might conceivably find their way to the beach. It is a good policy to assume that extreme conditions will be encountered i the life of every package of bea type aerosol and I do not think it unrealistic to attempt to balance the formulation for effective spray at a low of 75° and a high of 110°. Propellant combinations yielding lowest possible pressures should be used in all cases.

If pressure filling is employed, extreme care should be taken to insure elimination of all air from the package before capping. Whether by vacuumizing or gas purging is immaterial, as long as it is thorough. Regular and frequent pressure checks on the packages should be the rule throughout the pack. This is not meant to imply that these precautions should not always be taken, but it is a warning that real and extreme danger can develop if beach packages are made up by pressure filling, without extreme care.

It is true that the 130° test at the time of packaging is, to a great extent, an automatic safety check in the range I have mentioned, but the test procedure does not include holding a high temperature for four or five hours and certainly does not include stepping on the package with wooden beach clogs. It seems to me that the only safe procedure is to compromise

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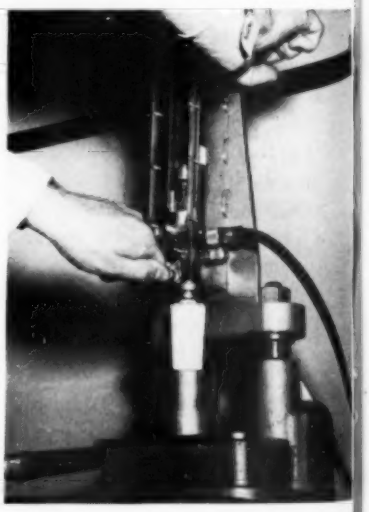
"It's easy



Typical of van Ameringen-Haebler laboratory leadership is this Liquified Gas Manipulator, first installation of its kind, with which the contents of any type container can be removed, replaced or transferred with complete flexibility under constant pressure.

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...but you know how"

So is Aerosol!

If you are planning to market a pressure-packaged product—remember that van Ameringen-Haebler, Inc. has overcome seemingly insurmountable problems for many manufacturers. The unparalleled excellence of the VAH Aerosol Research Laboratory provided with every facility for complete evaluation, formulation, progressive examination, test packaging and trouble shooting, plus the authoritative experience gained in the development of hundreds of successful aerosol products, is available to assist.

Although primarily concerned with matters of fragrance, VAH established its unmatched laboratory facilities to assist its customers in every phase of this new field of packaging, from product formulation to pilot runs for market testing.

STREET, NEW YORK 19, NEW YORK

NEWS of Pressure Packaging

Carter Signs Four

Final agreements have been signed by Carter Products, Inc. with Aero Shave, Burma Shave, Molle and Barbasol for licenses to manufacture aerosol shave foam products, it was announced last week by Henry H. Hoyt, Sr., president of Carter. These companies applied for licenses after the Circuit Court decision was announced recently (see *Aerosol Age*, May), upholding Carter's position in the case involving patent infringement by Colgate-Palmolive Co. and John C. Stalfort & Sons.

Mr. Hoyt further stated that Carter's position would remain the same; that is, anyone who wanted a license from the company for manufacture of aerosol shave foam could be licensed.

►

Changes in ICC Regulations

Favorable action is expected to be taken by the CSMA sub-committee for Public Regulations on a proposal to change regulations of I.C.C. regarding allowable pressures for metal containers when filled with a solution of nonpoisonous and nonflammable materials and non-liquefied compressed gases.

The proposal was submitted by CSMA to the Bureau of Exposives in April, but not to the I.C.C.. The Association indicated that no adverse comment had been received; final acceptance of the proposal may come at the meeting of the sub-committee on Public Regulations at the convention, May 20-22.

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ADMA Elects Valentine VP

The American Drug Manufacturers Association elected Kenneth F. Valentine of Pitman-Moore Co., Indianapolis, Ind., as vice president at its 44th annual meeting, April 30-May 2, White Sulphur Springs, W. Va.

Pickett to Head Isotron Sales

Appointment of Wiley J. Pickett to introduce a new line of aerosol propellants for the company was announced this month by Pennsylvania Salt Manufacturing Co. Mr. Pickett has joined the technical sales staff and will sell products from the company's new plant at Calvert City, Ky. to the aerosol industry. Scheduled for completion the end of this year, the project is part of Pennsalt's $55 million expansion program.

Mr. Pickett was eastern district sales manager of Lever Brothers' Industrial Detergents Dep't.

►

Trade Hears Sale Rumor

An apparently well-founded rumor is currently being heard in the aerosol trade to the effect that one of the owners of a leading company manufacturing aerosol valves has sold his interest in the company and will retire from any active participation in the management.

An executive of the valve company would neither confirm nor deny the report. The individual concerned was out of the country when *Aerosol Age* attempted to verify the report. It is expected that an announcement will be forthcoming from the company at an early date.

Incorporate Aer-O-Fil Engr.

Aer-O-Fil Engineering Corporation of 1188 Main Street, Bridgeport, Conn., has been incorporated with Lee J. Wallace as president. They will supply machinery and equipment to the aerosol industry.

The new concern can supply either completely equipped plants or the component parts necessary for either cold or pressure filling. This would include the propellant handling system plus processing equipment, including stainless steel tanks, kettles and filters; the filling line consisting of coding, cold or pressure filling, clinching, propellant injecting, heat test tanks and necessary packaging conveyors.

They have already designed and engineered complete aerosol lines for such companies as J. B. Williams Company, Daggett & Ramsdell, Inc., and Aerosol Techniques, Inc.

►

Alpine Aromatics Formed

Alpine Aromatics, Inc., Metuchen, N. J. has been established to specialize in sale of odorants for industrial use, it was announced recently by Raoul Pantaleoni, head of the new company. Mr. Pantaleoni was formerly director of the industrial division of VanAmeringen-Haebler, Inc., New York and before that was head of the aromatics laboratories of E. I. duPont de Nemours & Co.

►

Aeriform Reorganizes

Aeriform Products Co., Dearborn, Mich., is in the process of reorganization, according to a statement made last month by F. L. Lane, president. No further details were available; however, Mr. Lane did indicate that a large increase in production capacity is being planned.

Anti-Perspirants: Sales Rise Seen

The very nature of the product will be as big a stimulant to increased sales of aerosol anti-perspirants as the approaching summer season, according to a recent statement from Douglas Atlas, vice president of G. Barr and Co., Chicago.

A boost to 150 percent over last year's summertime sales was predicted and aerosols were expected to occupy an increased share of the year-round deodorant market.

Mr. Atlas said that 2,000,000 aerosol anti-perspirant units were sold last year, accounting for approximately three per cent of the entire deodorant market in retail dollars. He added that the product, first marketed only 16 months ago, is now coming into its own with sales this year expected to reach 5,000,000 units, or about seven and one-half per cent in retail dollars of all deodorant sales.

A large segment of the predicted increase will be due to male consumers' choice of this product, according to Mr. Atlas. "The swift, effective spray is adaptable to men's requirements for an under-arm toiletry," he reported — because the aerosol may be used easily on unshaved skin surfaces. An aerosol anti-perspirant eliminates having to wash any substance off the hands and the fast-drying quality of aerosol spray particles tends to avoid liquid running on the skin, or having to wait for the deodorant to dry before dressing, the G. Barr executive declared.

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Breck at Supermarket Conv.

Breck Hair Set Mist was prominently featured by John H. Breck Inc., Springfield, Mass. at its booth at the Supermarket Institute's Convention and Exhibit in Cleveland, May 6-9 The new Breck Hair Spray, which has been on the market for only a few months, comes in a 4½ oz. size packaged in a 6 oz. can, and an 11 oz. size packaged in a 12 oz. can.

Containers are supplied by Continental Can Co. and American Can Co. Caps of pink plastic are made by Owens-Illinois; the valve and insert are supplied by Precision Valve Co. Labels on both sizes of the product are white Kromekote paper printed with gold ink and a four-color process illustration of a flower.

►

Biological Aerosols Discussed

Speaking at the recent American Drug Manufacturers Association Meeting, in White Sulphur, W. Va., Maj. Gen. William M. Creasy, chief chemical officer of the army, appealed to the drug industry for aid in preparing the nation's defenses against biological warfare. The fact that most biological agents can be disseminated by means of aerosol clouds, he pointed out, raises a score of problems.

"For example," he said, "the vulnerability of the human respiratory tract as an avenue for infectious aerosols calls for serious attention to the problems associated with the pathogenesis of diseases that can be produced by such means."

The general suggested that a possible challenge for research, therefore, might be "whether our present-day vaccines for a disease normally contracted through drinking water would be effective if this disease were contracted through the respiratory tract as a result of an aerosol cloud."

►

Three Sizes for Antell

Charles Antell hair spray with lanolin and P.V.P., is now being distributed In the U. S. and South America in three sizes, 2¼, 4½ and 11 ounces.

The hair spray, packed in American Can Co. cans with high dome tops and recessed bottoms with blue, white and gold lithography, have a gold strip over the soldered seam, the first commercial use of this new solder-hiding technique.

Develop New Propellant Process

A new process for dispensing by means of pressurized containers was introduced May 11 by Connecticut Chemical Research Corp. at a press conference in New York's Waldorf-Astoria Hotel.

The "Polysol" concept was developed after research and investigation were completed on numerous propellant type gases not usually used in aerosols, such as helium, argon, neon, and others. The process uses non-refrigerant propellants, commercially available; and these propellants can be used in combination with each other or with refrigerant gases. New valves and processing methods were also developed to produce Polysols.

Spokesmen for the company said that new products such as antiperspirants, depilatory compounds, body rubs, mouth washes, medical inhalants, disinfectants and other personal items can be successfully formulated and packaged in Polysol. Patent applications have been made and further details on the process are expected to be revealed in August or September.

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"House of Magnus" Published

A new publication, "House of Magnus" begun with the April issue, is being distributed by Magnus, Mabee & Reynard, Inc., New York, in three editions: (1) Drug and cosmetic industry; (2) Food industry; and (3) Chemical specialties and related industries. The monthly bulletin contains news items and feature articles, giving information on application of MM & R products.

►

Methylene Chloride in Aerosols

Solvay Division, Allied Chemical & Dye Corp., is distributing a 13-page bulletin on Chloromethanes, listing 23 typical aerosol formulations using methylene chloride. The list includes insecticide, moth fumigant, room deodorant, artificial snow, garbage can spray, clear plastic spray, ignition water proofer, various paints and lacquers, shop layout ink, lubricating oil, penetrating oil, adhesive, oven cleaner, photoprint lacquer, aerosol detergent, silicone spray, and others.

Outstanding New Member of the Risdon Aerosol Valve Line

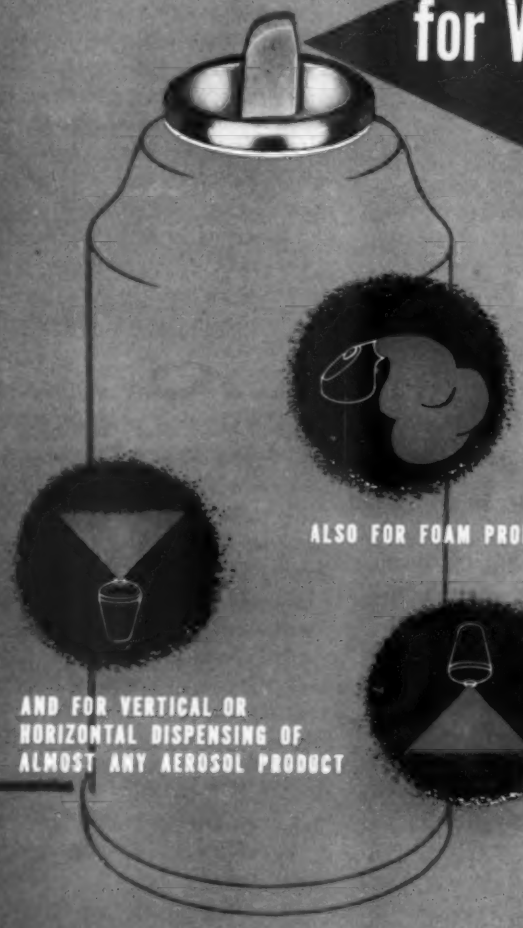
LOOK INTO RISDON'S NEW 5210 VALVE*

New Key to Spray-Packaging

for WATER-BASE PRODUCTS†

More Product—Lower Cost

†Applicable to bottles as well as cans for 3-phase Aerosols such as Window Cleaners, Pharmaceuticals, Anti-Perspirants, Medicinals and other products not soluble in propellant.



ALSO FOR FOAM PRODUCTS

AND FOR VERTICAL OR HORIZONTAL DISPENSING OF ALMOST ANY AEROSOL PRODUCT

One basic valve with 5 functions using various actuators for multi-product versatility . . . simplifies inventory. FOR FURTHER DETAILS WRITE FOR YOUR FREE COPY OF THIS NEW BULLETIN NO. 5210.

RISDON

THE RISDON MANUFACTURING COMPANY
Valve Division, Naugatuck, Conn.

*Fully protected under U.S. and Foreign Patents Pending

More "Freon" in September

Construction of new facilities for producing "Freon" in Antioch, Calif. will be completed and the plant is scheduled to go on stream about Sept. 1, it was announced by DuPont's "Kinetic" Chemicals Division last month. Initial products to be manufactured at the multi-million dollar plant are: "Freon-11" and "Freon-12." Warehouse facilities will be available within the next two months to speed delivery service in advance of the plant opening. The Antioch location will be the principal distribution point for "Freon" products west of the Rockies, after Sept. 1, the company said.

►

10 Years for Florasynth Pres.

William Lakritz was feted last month by many friends and business associates with words of congratulations and personal commendations when he turned the 10 year mark as president of Florasynth Laboratories, Inc., Bronx, N. Y.

"Business is considered intense, but I for one, make a game of it" . . . he said. "I have thoroughly enjoyed every minute of business effort and contact, and it seems that by just following this thinking, the Florasynth interests go along with it and have grown coincidently."

►

Williams Elected Scovill Director

S. T. Williams, general manager of A. Schrader's Son, Brooklyn, was named a director of Scovill Manufacturing Co., April 16. Scovill is the parent company of which Schrader is the largest division. He is also president and treasurer of Schrader-Scovill Co. Proprietary Ltd. of Australia.

►

Products Lab for Malmstrom

Irving Colbert is now head of a new products application laboratory for N. I. Malmstrom & Co., Brooklyn, New York, it was announced April 24, by Richard Malmstrom, director of sales. The laboratory is designed to service the cosmetic, pharmaceutical and allied industries on problems related to the company's products: lanolin, lanolin derivatives and cholesterol products.

Douglas Atlas

Atlas Wins Heart Fund Award

Douglas Atlas, vice president of G. Barr & Co., Chicago, was recipient of the 1956 Heart Fund Award of Merit, presented April 19 at the Chicago Heart Association's Business Division Victory Awards Luncheon. Mr. Atlas was honored for leading the Heart Fund's drug and cosmetic section which was first, among 85 business sections, to reach 100 per cent of its dollar goal and totaled 153 per cent of its goal at the campaign finish.

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TGA Re-names Mayham

Steve Mayham, executive vice president of the Toilet Goods Association, was voted to assume the responsibilities of the office again for the next year, by the board of governors at its meeting April 26. Also, Miss Kathryn Fitzpatrick was elected executive secretary of the Association.

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Award To DuPont Movie

The Film Council of America, Evanston, Ill., has selected the aerosol movie made last year by Kinetic Chemicals Division of E. I. du Pont de Nemours & Co., "The Spray's The Thing" for one of the twenty-two Golden Reel Awards which it makes annually. This is the top honor accorded non-theatrical motion pictures. The 16 mm film was made for Kinetic by John Sutherland Productions, New York and Los Angeles. It was a winner in the industrial sales and promotion category.

Frosty Snow Campaign

Howdy Doody and Clarabell, stars of TV, are on the 1956 Christmas promotion program of "Frosty Snow," made by the U. S. Packaging Div., Bostwick Laboratories, Bridgeport. The company will make stencils of Howdy Doody and Clarabell to be given free with each can of "Frosty."

A 125-station TV campaign, tieing in the popular characters with "Frosty Snow," is scheduled throughout the pre-Christmas season. The sales theme will be directed to both parents, and users of the push-button spray in holiday decorations, as well as the children's audience of "Howdy Doody."

►

Small Size "Americaine"

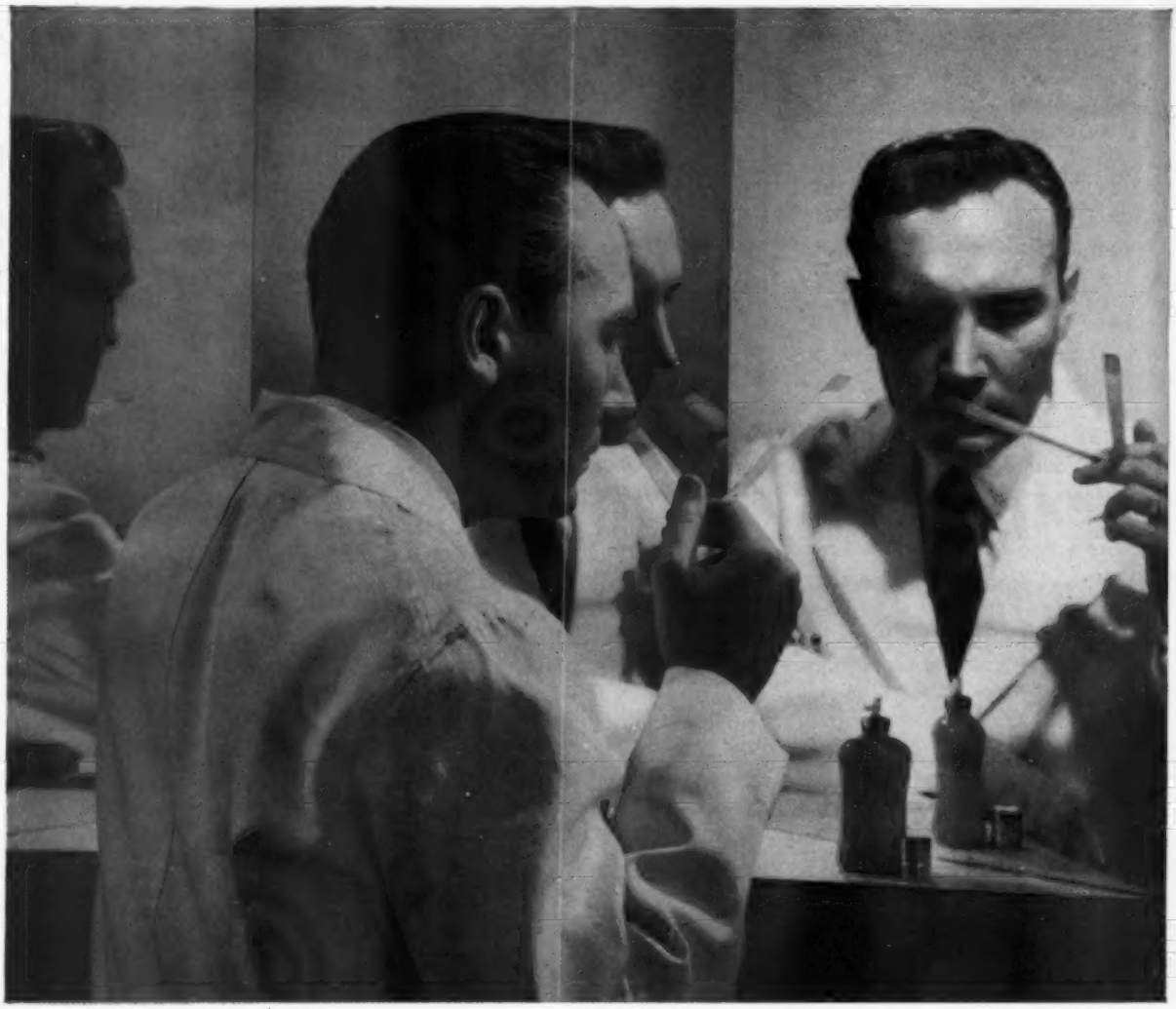
The topical spray "Americaine" is now being marketed in a smaller size container, a three ounce aerosol package, it was announced last month by Arnar-Stone, Mt. Prospect, Ill., manufacturers. The other sizes in the aerosol line are 5½ and 11 ounces. The product, a 20 per cent dissolved benzocaine and 0.39 per cent oxyquinoline benzoate in a water-soluble bland vehicle, gives relief for sunburns, wounds, abrasions and extensive dermatoses according to Arnar-Stone.

►

Acrolite Asks $50,000

Acrolite Products, Inc., West Orange, N. J., manufacturer of aerosol sprays for the graphics art field, has filed a $50,000 suit at Union County District Court, Elizabeth, N. J., against a leading aerosol valve manufacturer.

Acrolite alleges the valve manufacturer supplied pressure filling valves that were defective and unfit for use for the purposes for which they were purchased. As a result of these defective valves they were forced to accept returns of a great number of their products, had to scrap great quantities of inventory, lost various dealer and jobber and U. S. Government accounts, suffered loss of prestige and reputation in the trade and received adverse publicity attendant on the sale of aerosol products.



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Products— Processes— Bulletins—

Sun Tube Offers New Valve

The Sunex Division of Sun Tube Corp., Hillside, N. J., has just introduced its new aerosol valves for spray and foam applications. The spray button has a skirt that covers the valve housing portion of the mounting cup, and the foam dispensing head covers the complete mounting cup. The valves are offered with either brass or nylon stems.

Jiff-O-Jet Spray Attachment

A new attachment for aerosol cans which snaps on and off quickly and makes the container a "spray gun" has been introduced by Penn Square Products, Philadelphia. Called the "Jiff-O-Jet," one end of the tool is snapped on the aerosol container; the operator holds the handle and operates the on and off trigger with his fingers.

Tyrothricin Aerosols

Wallerstein Co., New York has distributed a three-page newsletter on the antibiotic, Tyrothricin U.S.P. and suggests that a spray containing the product — a stable, nonsensitizing agent of very low toxicity, effective against resistant organisms but not prone to develop direct or cross resistant organisms itself, and not inactivated by moisture or water — would be a valuable product.

Suggested use is in operating rooms, delivery rooms and wards to reduce the airborne resistant and nonresistant organisms. A light spray on bed linens should retard the development of bed sores, it is said.

New Aerosol Valve

Caldwell Casting Co., Inc., Baltimore, Md., have announced that the first of two newly developed valves is currently in production. It is a one piece, lever operated, needle valve with a self cleaning external orifice, a true non-clogging valve, which has been much in demand particularly for paints and coatings and other heavy solid content materials, according to the manufacturer. Both orifices and the expansion chamber are adjustable.

Inspection is speeded and greater accuracy is achieved in the removal of rejected containers with a clever technique used at G. Barr & Co., Chicago. To remove defective aerosol containers from the hot water bath, the use of a rod with a magnet at the end eliminates any need for the operator to come in contact with the hot water. Defective cans can be removed in this manner while still in the hot water, thereby assuring that the right can is removed. Bubbles issuing from the can of course point out the defective container to the inspector.

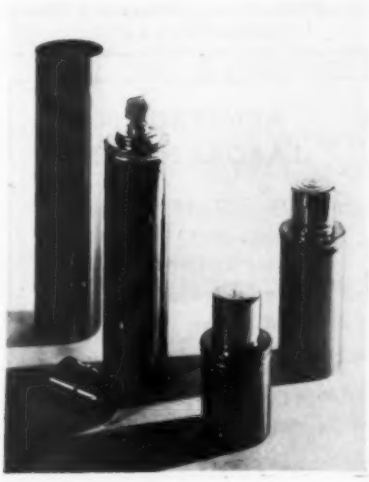
"The Aerosol"

The research department of Polak & Schwarz, New York, has prepared a 20-page booklet containing a comprehensive history of aerosols and a discussion of the problems of perfuming for the aerosol industry. Titled, "The Aerosol," the perfuming section of this brochure suggests that the main difficulties encountered with aerosols are caused by the behavior of the perfume composition under the conditions prevailing in the container, since it is exposed to varied influences for periods of time ranging from six to as many as twelve months.

Sprayon Issues Booklet

Sprayon Products, Inc., Cleveland, has just issued a new mailing piece telling the story of the company's research facilities and services for the aerosol industry. The 12-page bulletin tells how specialized formulations can be made up for manufacturers interested in aerosols.

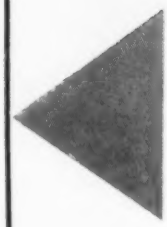
Emson Offers New Seamless Aluminum Containers



The aluminum aerosol packages by Emson Research, Inc. represent a new method of attaching a valve to the container. This particular design eliminates the standard cavity type mounting cup and presents a clean looking package, especially for products in the toilet goods and pharmaceutical fields. This particular container can be made either as an impact or a drawn container it is said, and has a specially designed top. There are no bottom seams.

Patents have been applied for this type of aerosol package which will soon be available in sizes from 1 to 4 oz. capacity.

Custom and Contract Packers



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French Review Aerosols

Parfums Cosmetiques Savons, monthly magazine of the perfuming industry in France, devoted its entire March issue to the aerosol industry. In dedicating the issue to the study of aerosols, the magazine said that it had a triple task: (1) to cover all present knowledge in the field, (2) to make a study of the industry for those interested in getting into the aerosol field, and (3) to take note of technical achievements in France and describe problems of particular interest to the French industry.

Feature articles included discussions of corrosion of iron and aluminum containers, propellants for aerosols, glass and plastic containers, valves, how to lay out a plant for efficient aerosol production, contribution of perfumes and fragrances to the aerosol package, insecticidal aerosols, and other related topics. A special section is given to formulation, in which ingredients and quantities of use for aerosol products are listed. Included are formulas for hair lacquers, shampoos, hair conditioners, perfumes, colognes, animal detergents, etc.

Literature Available

"Perfume Oils for Aerosol Products" is a 6-page folder by Rhodia, Inc., New York listing products specially designed to produce odor appeal, to be soluble in other components, and to satisfy the demands of corrosion resistance and compatibility.

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— *Convention Calendar* —

Chemical Specialties Mfrs. Association, *Drake Hotel, Chicago*	May 20-22
National Plastics Exposition (7th) *N. Y. City Coliseum*	June 11-15
National Hardware Show, *New York Coliseum*	June 25-29
Packaging Institute, 18th annual forum, *Statler Hotel, Cleveland*	Sept. 11-14
Packaging Machinery Mfrs. Institute, annual meeting, *Skytop, Pa.*	Oct. 5-8

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Who's Who in the Aerosol Industry

George Barr, at the young age of 43, heads a company that has grown to be one of the largest factors in the nation for the manufacture of aerosols.

A native of Superior, Wis., Mr. Barr was graduated from The University of Wisconsin in 1933 with advanced degrees in chemistry. He then started his own business in Chicago, selling a hair wave-set which he had formulated, to retail druggists. G. Barr and Co. was founded in 1935.

Business expanded and the company went into chemical manufacturing and private label packaging. He sold his formulas for wave-set and hand lotion to other companies, and discontinued manufacture of products under the Barr label. The company grew to leadership in private label cosmetic and drug manufacturing. After World War II, Mr. Barr saw the future for aerosols and their potential application in pharmaceuticals and toiletries and in 1949 entered the aerosol filling business. The company production is devoted almost entirely to aerosols now. It operates plants in New York and Los Angeles as well as in Chicago (where about 200 are employed).

Since 1952, Mr. Barr has served as Chairman of the Illinois Governor's Committee on Employment of the Physically Handicapped; he is also president of the Chicago Easter Seal Society and a member of the national Young Presidents Organization.

Edmund G. Young, sales development manager of DuPont Co.'s "Kinetic" Chemicals Division, is a native of Baltimore, Md., and obtained both his B.S. degree in chemistry and his doctorate in organic chemistry at the University of Maryland.

In 1943, he became associated with Sharples Chemicals, Inc., Wyandotte, Mich., and in 1944 joined the Jackson Laboratory staff of the DuPont Co.'s Organic Chemicals Dept. at Deepwater, N. J. to do fluorine research.

When Messrs. Goodhue and Sullivan of the U.S. Dept. of Agriculture were developing better methods of dispensing insecticides for use by the armed forces, Dr. Young was placed in charge of sales service for "Freon" refrigerants and aerosol propellants.

He was named propellant sales manager for Kinetic Chemicals, Inc., in 1949 and assumed his present position of sales development manager of the division in 1950.

An active member, in the aerosol division, of Chemical Specialties Manufacturers Association, Dr. Young was named chairman of that group's Aerosol Scientific Committee in 1949. From 1951 to 1952, he served as chairman of the CSMA Aerosol Products Survey Committee and in 1952-1953 was chairman of its Aerosol Administrative Committee. He was re-elected to a three-year term as a member of the CSMA board of governors last December.

William Waren Rhodes, the first sales director of Kinetic Chemicals, Inc., now Kinetic Chemicals Division, DuPont Co., was executive head of a research team which led to the Euker and Doudt patent for the continuous catalytic process of making Freon 11 and Freon 12. He was the first chairman of the Aerosol Committee and the Small Containers Committee of the Compressed Gas Manufacturers Association. He is a past president of the Priestley Chemical Club, oldest association in the U.S. devoted to chemistry, and is a past member of the American Society of Refrigerating Engineers. "Dusty" Rhodes, now retired in Mexico, still maintains an active interest in the entire aerosol industry.

News . . .

News about their industry, — fresh news about what is happening in the trade, — what their suppliers and competitors are doing. That's what the average subscriber is most interested in seeing in the trade paper which he reads.

There is an old saw in the publishing business, — something to the effect that publishers don't make the news, they just print it. And it's very true!

We will do our best to print everything newsworthy that concerns the aerosol industry and those in it, but we are necessarily going to be mighty dependent on our good readers to keep us informed on what they are doing.

If you bring out a new product, add a new man, open a new office, develop a new process, or install new production lines, try to remember to let us have the details. A free and rapid exchange of information on all that is new in the field can be very helpful. And we will appreciate the assistance too.

Help make AEROSOL AGE your magazine.

►

AEROSOL AGE

Box 31

CALDWELL, N. J.

Congo Pyrethrum Extract

Pyrethrum growers in the Belgian Congo and Ruandi: Urundi plan to erect an extraction plant in Africa.

An announcement from Goma, the Congo's pyrethrum capital, states that the growers have signed a contract for $500,000 processing plant which they expect will handle all of their flower production not otherwise processed locally before the end of 1957.

The new plant is to be constructed by a Belgian company under specifications calling for "25 per cent of crude extract or a refined extract which will meet American specifications for the manufacture of aerosols."

Personal Products

(*from page* 55)

on a formula whose optimum spray is near the upper limit of the temperature range (i.e. absolutely minimum package pressure).

Most aerosols used on the beach require the deposit of some material on the surface of the body. This in turn requires a wet spray with fairly large size particles. If the high temperature at point of use is not considered, and normal formulation criteria are used, we can expect that fine, dry, airborne, clouding-off type spray will result under normal use, which will be ineffective and wasteful. It is certainly much better to deliver a relatively non-atomized stream at the lower temperature level (75°) which would nevertheless allow effective spreading of the material by hand, than for a too dry and unusable spray to be delivered at the upper temperature levels.

In addition to proper formulation, it is most important that labels meant for beach packages be made up with great care. Precautions concerning maximum storage temperatures and proper handling should be emphasized. A rather important consideration, in addition to the physical dangers, is the physiological danger of breathing sprays which may be made up to be essentially waterproof. A warning to avoid inhaling excesses of oil sprays might well be included in the labels.

Glass packages have been used for beach type personal products and in many cases have been considered premium type packages. It does not seem possible that anyone would consider anything else, but just for the record, do not attempt beach type packages in any glass save the plastic coated glass bottles. Not only is there possible danger otherwise, but more and more beaches are entirely prohibiting any kind of cosmetic glass on the beach, pressure packaged or otherwise, with the exception of plastic coated bottles. There is certainly no point in making packages which may be illegal in many places.★

►

Handy Button Capacity Rises

Over 100 million cups per year is the new capacity for flowing in gaskets in mounting caps, recently announced by Handy Button Machine Co., Chicago. Further expansion is planned, according to N. H. Perlman, president.

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C.S.M.A. Meeting

(*from page* 51)

11:00 A.M.—Public Regulations Sub-Committee, *W. Earl Graham*, chairman.
12:00 Noon—Commercial Standards Committee, *R. W. Svendsen*, chairman
1:00 P.M.—Definitions and Terms As Applied to Aerosols Sub-Committee, *Ralph C. Downing, chairman*
1:00 P.M.—Unofficial Rules and Regulations Sub-Committee, *R. V. Sharpless*, chairman
1:00 P.M.—Glass Container Sub-Committee, *Walter C. Beard*, chairman.
2:00 P.M.—Special Committee on Pressure Determination, *Pete Clapp*, chairman
2:00 P.M.—Product Survey Committee, *Frederick G. Lodes*, chairman
3:00 P.M.—Scientific Committee, *W. E. Baulieu*, chairman
7:00 P.M.—Glass Bottle Advisory Committee, *Lawrence P. Hall*, chairman

The Aerosol administrative committee will meet again Monday at 3 p.m.; the program committee has scheduled a meeting at 7:45 a.m. (breakfast); and the publicity committee will convene at 2 p.m.

In the course of the meeting it is planned to present an award to a representative of the Kinetic Chemicals Division of duPont honoring the company for its aerosol motion picture, *The Spray's The Thing*, which was selected by the Film Council of America for one of the Golden Reel Awards in this year's competition.★

►

Rhodia in Larger Offices

Expansion of the Aromatics, "Alamask" and other divisions of Rhodia, Inc., New York took place March 19 when the company moved to new offices at 60 East 56th St., New York.

Jacques P. Sibeud has been appointed manager of laboratories for the company. Dr. Sibeud was with Rhone-Poulenc, Paris, until his transfer to Rhodia last month.

Fragrant Aerosols

(*from page* 39)

aerosol form. These latter fields — foods and pharmaceuticals — may even offer more potential for aerosols than can be expected from the fragrance products.

Aerosols are still in their infancy. As they grow older there will be

READERS:

Are you taking full advantage of your *new Aerosol* magazine?

The staff of **Aerosol Age** want the pages of your industry's new magazine to be as valuable as possible. We will bring you articles dealing with new developments in aerosol containers, propellants, valves, filling equipment, etc. as promptly and as fully as possible. Photos of new products, brief biographical sketches on important figures in the industry, and monthly summaries on developments in the aerosol market overseas will likewise be regular monthly features.

Our climbing subscription figures indicate your appreciation of our efforts. But are you taking full advantage of your new aerosol magazine? Two of our regular columnists, Robert Foresman (**Your Aerosol Consultant**) and Harold Lee (**What's the Question**) are well prepared to answer questions on typical industry problems in their respective fields. If you have a troublesome problem dealing with formulation, packaging or marketing of an aerosol product, perhaps one of these specialists or others on the staff of **Aerosol Age** can help you solve it.

If you are a subscriber and have such a question, just jot it down on the coupon below and sent it along to us. If it is of sufficient general interest, we'll be glad to try to answer it for you in our next issue — and the service is free.

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many advancements made in design and manufacture. As time goes on, the pressure package will be found in many places where conventional package types have previously been used. Although they will not replace the conventional containers completely, aerosols will certainly grow up from being the kid brother in the packaging field.★

Aerosol Insecticides

(*from page* 26)

The residuals are usually between 75% formula and 25% propellant and 50% formula and 50% propellant. Valve orifices are generally in the .030-.031 diameter depending on filling ratio, solvent, propellant and formulation characteristics.

The pressurized residuals are also widely used as moth proofers. Many good and effective formulas use DDT, methoxychlor, or combinations of both. Sometimes ortho or paradichlorbenzene and other ingredients are used in combination. The above solids require methylated naphthalenes as solvents, and thus there is an odor condition.

Recently Strobane and Perthane have come into wider use. These products have good mothproofing qualities. Of greatest interest is their easy solubility in odorless base oils or isoparaffins, without needing any cosolvents. This thus gives an almost odorless moth proofer, a characteristic which has stimulated wide interest and made this moth proofing package more acceptable to the housewife. Moth preparations are usually formulated at either 60/40 or 50/50 ratios.

"Odorless" Aerosols

There has been a trend toward so-called "odorless" aerosols. These have frequently used the odorless methylene chloride as a solvent for DDT and methoxychlor, in place of the methylated naphthalenes.

The use of Strobane and Perthane in space aerosols has also given an "odorless" type aerosol, since both these toxicants are soluble in odorless base oils and isoparaffins. This has made a very acceptable aerosol, with little odor, which is easily perfumed. There is expanding interest along these lines.

Pressurized Space Sprays

Other products in the lower price field are the Pressurized Space Sprays. These are in a few types, of 65/35 ratio or 60/40 ratio, and usually use 35% of Propellant 12, plus methylene chloride as part solvent and part propellant component. In this way DDT and methoxychlor are used. A very general formulation would have .1% allethrin or pyrethrins, .25% synergist, 1% or 2% of Lethane or Thanite, and 1% to 2% of DDT or methoxychlor, or combinations of both.

A more recent and possibly more interesting Pressurized Space Spray is the newly approved non-toxic type of Push Button Spray which has a 60/40 ratio, using 40% propellant 12. This formulation gives at a 60/40 ratio, .15% pyrethrins and .50% piperonyl butoxide, with odorless petroleum distillate as the vehicle. This opens up some interesting possibilities in the lower cost, non-toxic pressurized space sprays. In a sense, it represents a meeting ground between the older and popular oil base pyrethrum type household spray, and the modern push button aerosol package.

The aerosol industry is indebted to the U.S.D.A. for the development of the aerosol principle of spraying insecticides, and to the research of L. D. Goodhue and W. N. Sullivan which resulted in Patent No. 2,321,-023, and which is the basis on which the Department of Agriculture issues licenses to manufacturers of aerosol insecticides. The aerosol and insecticide industry is also indebted to the continuous research and cooperation of the U.S.D.A. who are always willing and helpful in our many problems.

The growth of this field owes much also to the research and development and the contributions of the manufacturers of insecticides, propellants, valves, cans and filling machines. It is this spirit of "competitive cooperation" that has kept this industry active and growing.★

Aerosol Labeling

(*from page* 41)

uct to make a good foam when the valve is activated. With shaving creams and shampoos, the instructions should tell in simple terms how much of the product to use and specifically how to apply (first washing the face or wetting the hair, etc.).

With lacquers and paints, the instructions should emphasize the fact that the valve must be cleared and cleaned after each use by turning the container upside down and activating the valve in this inverted position. When this simple precaution is observed, after the product in the diptube is expelled in one or two seconds the escaping propellant will, of course, clean out the internal parts of the valve, minimizing the possibility of clogging. By emphasizing such necessary precautions on the label, complaints about stopped-up valves and claims for returned containers can be minimized.

The following precautionary points for all aerosol containers should be included in the labeling:

1) Shake well before use.

2) Avoid exposure to high temperatures. Keep the container at room temperature and away from direct sun light, radiators, stoves, hot water or other heat.

3) Do not puncture the container. When empty do not try to open. Throw away, do not burn.

4) Remove protective cap and aim the spray opening away from the person. Be sure of the spray direction before pressing button.

The following suggestions as to precautionary points are particularly applicable for aerosol insecticide containers:

1) Avoid spraying on the face and do not spray in the eyes.

2) Never spray insecticides on open food.

3) Never spray insecticides on plastics or asphalt tile.

4) Avoid prolonged and undue exposure to any insecticide mist.

5) Avoid direct inhalation of any insecticide mist.

6) Do not spray insecticide space

sprays directly on animals or on the skin. In case of such contact, wash the exposed area with soap and water.

7) Before space insecticides are sprayed, be sure to remove birds, pets and fish bowls from the room.★

Aerosol Containers

(*from page* 33)

cans, but the use of sensitive dyes to obtain certain colors sometimes makes an enameled can necessary.

Many pressurized cosmetics such as hair lacquer have been packaged in plain cans. Each formulation change must be considered a new product, container-wise. Fortunately the recent change from one material base to another for some hair lacquers did not affect the present container specifications, but a future change might.

As in any simplification, there are undoubtedly exceptions to these general aerosol classifications.

The aerosol and pressure packaging industries have grown tremendously in the past five years. Last year an estimated 200 million units were sold, and aerosol products were used by some 91 per cent of the families in the United States. As the industry continues to grow and become even more competitive, new types of containers undoubtedly will be introduced.

The one-inch cup has been a boon to the aerosol industry during its early years and will continue to serve as a universal closure for many different sizes and shapes of cans. However, it may be replaced by a less expensive closure for some applications.

A full open top, three-piece can with the valve staked directly into the top has been on the horizon for several years. As the industry grows, volume producers of pressure packed products will be more apt to use this type of can because of its lower price. The open top can has only three pieces of metal instead of four and eliminates the crimping operation. Eventually it may be possible to close this type can at speeds of several hundred cans per minute.

Although some sectors of the industry are encouraging standardization of containers to permit high speed production, others are working towards even greater diversification.

Packers seem to be interested in both smaller and larger containers. Already a demand for containers small enough to be carried in a purse has set off a chain of development work in that direction. These smaller-than-usual containers may require special valves to meet the requirements of the package.

Only a year ago the sixteen-ounce pressure can was introduced, but now industry is thinking of the possibilities which still larger cans may hold for them. Major considerations in the use of large cans are: (1) formulation of products for which larger containers would be the natural size; (2) public demand for more economical packages; (3) new container construction techniques to provide necessary strength; and (4) new valve designs for lower pressure propulsion.

In the future, container manufacturers will continue to incorporate new items into aerosol containers as proven demand exists. The development of the light can, the three piece can, the stacking feature bottom, and the sixteen-ounce aerosol can will be followed just as rapidly by other innovations, as required to keep abreast of public tastes.★

European Market

(*from page* 47)

skin lotions and others. Production has been limited on these items until very recently.

FOAM PRODUCTS: Shaving foams in the countries surveyed are loaded by 4-5 national and U.S. license companies. Local fillers are expected to augment production very soon.

SUN-TAN PRODUCTS: Only 2-3 fillers of oils are known.

PAINTS: In England, production of aerosol paints has gained a significant share of the market. Production is still discouraging in the other countries, mostly due to formulation and valve difficulties.

OTHER PRODUCTS: Anti-rust aerosols, metal cleaners, polishes and other products in this line are just

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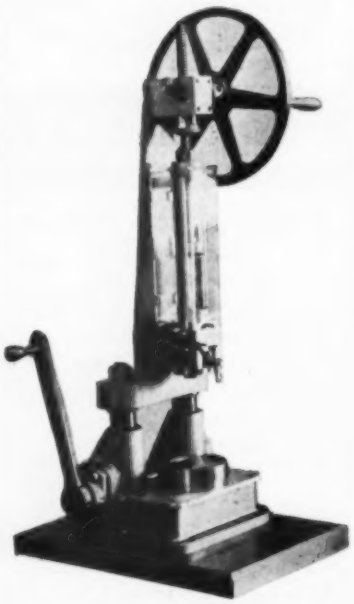

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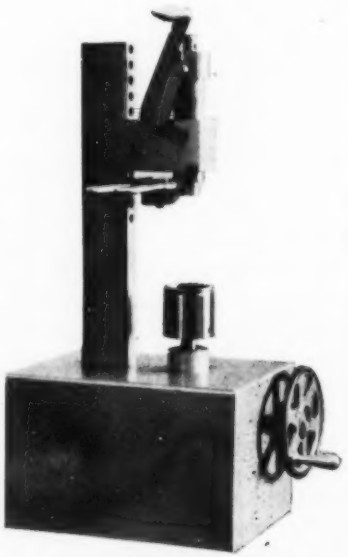

Foresman Hand Operated Vial Capper

beginning to find their way to market. Conspicuous by their absence in these countries are the following: whipped cream and other food products, shampoos, sanitary, cleansing and pharmaceutical aerosols, silicone products, animal repellents, etc.

There are many reasons to explain the comparatively slow advance of aerosol development in Europe. Until 1954, sheet metal and aluminum have been scarce, their qualities still leaving much to be desired. Early experience with corrosion did much to discourage potential fillers. New processes recently introduced in Germany and Italy now have given aerosol fillers better drawn and welded cans. Glass bottles are being produced in several countries. France is making, under U.S. license, a special glass needing no plastic covering and German research is moving forward on this type of container. Clear plastics for covering are not yet available from European sources; also, no European plastic containers for aerosol are on the market. Plastics in general, as needed for the various parts of aerosols are a bottleneck in all of Europe and have to be imported from the U.S.

One of the severest marketing difficulties encountered in most European countries is probably the markups by retailers, considered excessive because, as a rule, they are doing no advertising or demonstrative displaying in favor of their own turnover in aerosols. Fillers are either forced to find their own outlets to build up their retailing or to see the prices of their products pushed above the consumer's willingness to pay.

Prices do vary considerably; in some cases consumers seem willing to pay the black market prices for aerosols. In Switzerland, the least expensive European packed shaving foam sells retail for SFr 4.50 ($1.04), while a U.S. filled product has appeared on the Swiss market in 6 ounce size for SFr 3.50 ($0.82), freight, duty, charges and retailing included. In Paris, a well known brand of French cologne in a 4 ounce bottle is offered for ffrs 1.200 (3.60), and a French luxury type of perfume sold in Switzerland for SFr 57.85 ($13.47) the 2 ounce bottle. Imported U.S. hair-sets sell in Switzerland for SFr 18.25 and SFr 15.50 ($4.20 resp. $3.60), while in the U.S. these same products in 12 ounce containers retail for $2.05 and $1.75. Good Italian insecticides, 8 ounces, retail for 600 Lire ($0.95), while the comparable French product sells for ffrs 700 ($2.10). Prices in Germany compare with those in Switzerland, luxury products having better consumer appeal. More advertising and better retail service are extended to these products so aerosols in Europe tend to become luxury products.★

Aerosol in Italy

(*Continued from page 47*)

mounting cups made from tin-plate seem to stand up just as well. Also, in internal lacquers for aluminum, the Italians seem to have solved the problems. Aluminum cans we have had for about two years function just as well as when purchased. We hear a lot of stories about corrosion in aluminum cans and heavy losses; but though we have tried diligently, we have never been able to run down one of these stories. They are always about somebody who told somebody else, and the location or country gets farther and farther away as the story is repeated. Tin-plate producers have good reason to be thoroughly concerned.

This aluminum aerosol can (but not in one piece, which only Italy has so far) has also appeared in Switzerland, Germany, France and the UK. It is a popular and from all information a thoroughly satisfactory aerosol can, but does require — along with its tin-plate brother — the right kind of internal lacquer.

In aerosol advertising, the Italians are way ahead of the other Western European countries. They have attractive labels with cartoons which leave no doubt about the effectiveness or use of the contents. Their drug stores and grocery stores devote complete windows to aerosol displays for which the manufacturers furnish large illustrated placards. At the recent Milan Fair, aerosols were prominently displayed by a number of

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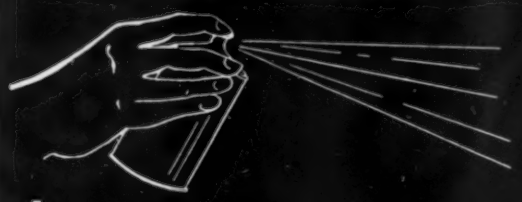

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loaders, and Bombrini Parodi even had a motion picture showing the manufacture of their aerosol cans. When most Europeans hit Italy for the first time, they tend to regard Italian advertising as an illness, but it seems to be effective, too, as well as startling.

We look for continued expansion in the Italian aerosol industry. All loaders have confidence and the number of stations is increasing. Plans are afoot to bring out an expanded line of products including hair dressings, foam products and some lacquer. But most of all, our compliments to the Italian industry for developing the one-piece, non-leakable, cold extruded, reasonably priced aluminum aerosol can which may well be the aerosol can of the future.★

Methylene Chloride

(*Continued from page* 29)

O-Matic deep well pumps (Gould Pump Co., Seneca Falls, N. Y., can be used to advantage to feed a Yeomans vane type pump (Turbine Equipment Co., 75 West Street, New York, N. Y. when drawing from a buried storage tank.

Pumps with mechanical seals should have bronze not rubber bellows. One producer uses Mission centrifugal pumps (Mission Manufacturing Co., Houston, Texas) type B-11 with semi-open impellers. They are sealed with John Crane mechanical seals Type 9-B, with 1⅜ inch diameter Chemlon rings (Crane Packing Co., Morton Grove, Ill.) These pumps are directly driven through flexible couplings. Turbine pumps equipped with Dura Seals (Durametallic Corp., Kalamazoo, Mich.) give very satisfactory performance.

Where pumps with packing gland seals are used, one experienced user replaces the packing with a Garlock leather ring closure, backed up with a Neoprene O-ring seal. This packing gives good service. The leather will lose its flexibility with time, but the packing is easily replaced. It has been found in aerosol plant service with methylene chloride that the graphite in graphite type packing washes out too easily.

Lithium based greases (Alvenia No. 5212, Shell Oil Co.) are reported to work well with methylene chloride due to their superior resistance to its solvent action.

Valves and Gaskets

As might be expected, a variety of satisfactory line valves are found in use in methylene chloride handling. Among those mentioned by various users are Muller packless valves, Lukenheimer valves, Crane cast iron valves with CR-13 trim and Grinnell-Saunders Teflon diaphragm valves.

For relief valves, a Gerotor valve (Compressed Air Products) has been found to work quite well on a Gerotor pump by-pass line. On storage systems that get only intermittent use, the balancing piston of this relief valve may stick, due to some slight corrosion. One user has remedied this trouble effectively by removing the piston, turning it down about 2½ thousandths and then giving it a chrome plate.

For general use in gaskets, Vellumoid has given good service (Vellumoid Co. of Worcester, Mass.) Teflon valve packings function well with methylene chloride.

Filters

In aerosol production, filters are important since any fine rust or sediment particles that get carried through to the final package may ultimately plug the valve orifice. Slight amounts of sediment or rust flakes that might be tolerated in the filling of non-aerosol chemical specialities can not be allowed in aerosol production. On the methylene chloride line, Neugent filters with stainless steel spacer mats and cotton bags have worked well. These are available from the William Neugent Co., 236 Mills Street, Boston.

Production Applications

In the formulation room, methylene chloride has many useful applications. Its excellent solvent action for many insecticides, perfumes, oils, fats, waxes and resins may be used to speed the preparation of many types of non-aqueous formulations.

The high solvent action of methylene chloride, and its relative economy as shown in Figure 5, make it advantageous in production and formulation room clean-up operations. Further economy may be achieved by the use of simple batch distillation apparatus for recovering methylene chloride from salvage and flushing residues.

Summary

Methylene chloride has been found useful in aerosol production as a propellant component, solvent, active ingredient in such formulations as oven cleaners and paint removers and as a good solvent for production clean-up and line flushing operations. For the average aerosol producer consideration of bulk storage of this material is of interest and some comments have been offered on current handling practices of some aerosol producers experienced in using this material.★

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Acknowledgements

The author is greatly indebted to the many individuals and companies who have provided information and suggestions for this report, especially to Vincent J. Blaine, division Superintendent, and Frank W. Hawley, supervisor of production formulation, of the Aer*A*Sol Division of the Bridgeport Brass Company, to Albert Osman Jr., plant engineer of Powr-Pack, Inc., to Lee Wallace, president of the Wallace Company, and to the Product Development Department, Solvay Process Division, Allied Chemical and Dye Corporation under whose sponsorship this study was made. The cooperation of these persons and their companies is sincerely appreciated.

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OVER THE TRANSOM

MAY 20-22 will find members of the CSMA assembled at the Hotel Drake in Chicago for their 42nd annual mid-year meeting. It will be like old home week for this reporter to attend a CSMA meeting, or perhaps more like returning to the scene of the crime. His first session with the group — it was then the NAIDM of course — was in 1928. That year Doc Hamilton was president and John "Powco" Powell, the boy pyrethrum king, was vice president. John, whose meeting topic was "Teaching Salesmen To Sell Insecticide," had a thatch of long wavy pompadour style hair in those days, while Harry Cole, perennial secretary of the association had absolutely none. Among those gathered at the McAlpin in this tail-end phase of the bath-tub gin era were such stalwarts, some long since departed, as Evans Stone, Arthur Ponder, Larry LaCava, Dr. Dreyfus, Nels Gothard, Jim Varley, Bill Hatfield, Harold King, Doc Peet, and a corporals guard of compatriots. Today about twice as many attend a CSMA board of governors meeting as used to attend the entire convention in the late twenties.

* * *

Those were the days when you could sum of the insecticide raw material suppliers by saying Powell, Penick, MGK, and Hopkins. Prentiss hadn't even been started, Rohm and Haas had just brought out "Lethane," the first of the synthetics, and chlordane, DDT, aldrin, dieldrin, thanite, etc. were years in the future. The aerosol business didn't even exist, except perhaps as a sly gleam in the collective eye of Goodhue and Sullivan.

* * *

The Terry fly spray patent suit was still a year or two in the future, National Insect Killing Week was yet to be born. We were five years short of Pete Dougan's famous survey of the industry under the NRA code. Seuss was doing his "Quick, Henry, the Flit" drawings for Stanco, Art Srebren had not yet "invented" synthetic pyrethrum, Rus Stoddard was sales manager of Ungerer, Charlie McCormick hadn't become famous by writing his book, and Ward Baldwin, perennial stormy petrel of the NAIDM gatherings in later years, hadn't yet thought of "Dwin." Campbell Baird was serving his ninth term as chief pilot of the celebrated NAIDM steam roller, and the major debate at each meeting centered on the relative merits of the Rideal-Walker vs. the Hygienic Laboratories method for testing disinfectants. Many of today's prominent figures in the aerosol business were still in knee pants.

* * *

Theme song of each NAIDM convention was "On Wisconsin," and Doc Weed was still strictly a kazoo player, not having graduated to the current kettle drum phase. That famous industry hymn dealing with the medical efficacy of pyrethrum had not yet been composed. Matter of fact its premiere was years later at the long-to-be-remembered dinner which the members of the Kenya Pyrethrum Board tendered to top figures in the insecticide business at the Ritz Carlton.

* * *

"Van" had just about started his annual generous gesture of handing out samples of perfume, and Charlie Opitz, the industry's practical joker menace, hadn't yet thought up the idea of pouring the entire contents in the pocket of some unwary bystander. Dirty tights and bare bosoms were the theme of the floor shows, and open house consisted of taking the cork out of a jug of alky flavored to resemble gin with Fritzsche's famous fondant XXX. No one had ever tried to collect "corkage" from those who lugged their own bottles to the banquet, luncheons were about two fifty per and a round trip ticket cost ten bux, instead of fifty.

Much has changed since those days, and we suppose it all goes under the head of progress. But one feature of those old convention days always seemed unchanging and unchangeable, — the famous steam roller. We won't see it much in evidence at Chicago. It makes its annual run around election time. We predict that come next December in Hollywood, at the appointed time, it will roll majestically out once more. A calculated four seconds after the nominations are presented, a high tenor voice down front will be heard moving that the nominations be closed. Three seconds later, way in the back of the room, a deep base will boom out "second the motion." And if you intend to be there to watch it roll, take our advice and tie up your room right now with a solid guarantee, — for otherwise you may end up in one of those motels just a short "courtesy car" ride away from the Hollywood Beach.

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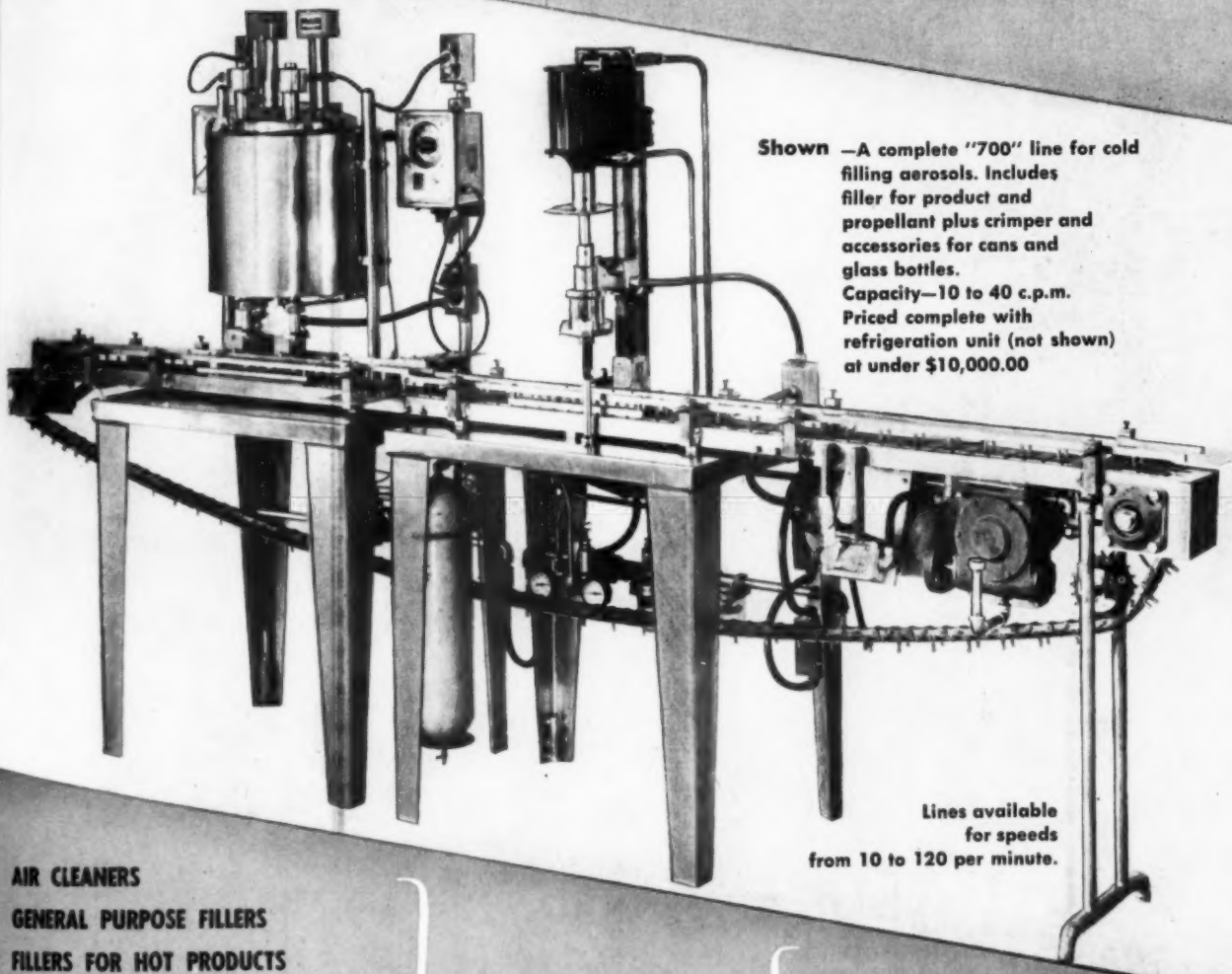

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